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VALUE OF CALMETTE VACCINATION IN PREVENTION OF TUBERCULOSIS IN CHILDHOOD

ARVID WALLGREN, M.D.

GOTHENBURG, SWEDEN

In a critical survey of the reports on experimental vaccination on human beings I attempted in 1926 to draw up some principles for carrying out an antituberculous vaccination. Tentatively I began working along these lines and as the experiment seemed to turn out well I have continued along the path struck. In 1928 I published in THE JOURNAL a preliminary account of my experiments,[1] and I now submit the results achieved up to the present.

The history of the production of the B C G vaccine is no doubt well known and I shall therefore content myself with mentioning that the vaccine is composed of an originally virulent strain of bovine tubercle bacilli, which by means of certain methods of cultivation has been made very nearly avirulent. To be approved, a vaccine of this kind should fulfil at least these two primary conditions: It should be free from any element of danger and it should be effective.

With regard to the first of these requirements I dare say that the majority of my auditors are well aware that opinions have differed rather widely. The charge has been made that the vaccine or some bacillary agents contained therein are virulent, and in proof of its danger the report of one unfavorable instance after another has been published. A careful and critical study of the available literature shows, however, that up to the present not a single one of the million children who have been vaccinated has suffered any evident harm from a correctly prepared and correctly employed vaccine. From this it would seem that one is justified in drawing the conclusion that under these conditions the vaccine is safe. I shall report later my own experience with regard to the harmlessness of the vaccine.

Opinions differ also concerning the efficacy of the vaccine. This is chiefly due to the difficulty of procuring control material for comparison. On this account the vaccination experiments carried out in France on such a gigantic scale have not been considered conclusive. That the vaccine does produce a certain amount of immunity in animals has, on the other hand, been definitely proved. When the vaccine is injected in suitable doses into certain animals, they become sensitized to tuberculin after the lapse of a certain time and are less susceptible to mild virulent reinfections than untreated control animals.

That even human beings acquire a certain increased resistance by means of a B C G vaccination resulting in tuberculin sensitization has been proved by Heimbeck's experiments on tuberculin negative probationary nurses at Oslo. Out of 136 nurses vaccinated, only three became ill after having attended tuberculous patients in the course of their duty, while of the thirty-four unvaccinated probationers, unaffected when they began their duty, not less than fourteen fell ill with tuberculous disease. This is the only experiment in vaccination performed on human beings so far in which an adequate control material has permitted a comparison between vaccinated and unvaccinated subjects. This experiment furnishes definite evidence that a B C G vaccination is capable of producing a certain degree of immunity even in human beings. The report given before this section last year by Park, Kereszturi and Mishulow [2] of the vaccination experiments carried out in New York also lends support to this view.

A virulent primary infection does not produce more than a very relative immunization, and since the avirulent B C G infection is surely less intensely immunizing than a virulent infection it cannot of course be expected that a vaccination will afford absolute protection. That would be placing too great a demand on the vaccine. It should also be clearly understood that a B C G vaccination cannot protect the individual from secondary or tertiary tuberculous diseases any more than a natural tuberculous infection can do so. At best it can only prevent the severest forms of primary tuberculosis.

In my vaccination experiments I have followed these two principles: First, only healthy children in danger of being infected have been vaccinated; second, the vaccinated children have been protected from virulent infection until they have become sensitized to tuberculin by the inoculation.

From what has just been said it is evident that as yet there is very little information and experience relating to the usefulness of an antituberculous vaccination in children. The extent to which it protects the child against the dangers of a virulent infection is not known, nor is there any knowledge of the duration of such a protection. Under these circumstances the wisest plan seems to be to confine vaccination to those children who may be suspected of being exposed to the risk of infection in the near future. This is the case with all children of tuberculous parents.

In order to obtain any benefit from being vaccinated, the child must be free from tuberculosis. An infected child has already by means of the natural infection acquired that immunity which a vaccination is intended to produce. Hence, vaccinating an already infected child is absolutely superfluous. But it is not only

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1. Wallgren, Arvid: Intradermal Vaccinations with B C G Virus, J. A. M. A. **91**: 1876 (Dec. 15) 1928.

2. Park, W. H.; Kereszturi, Camille, and Mishulow, Lucy: Effect of Vaccination with B C G on Children from Tuberculous Families, J. A. M.A. **101**: 1619 (Nov. 18) 1933.

superfluous; it should also be avoided. In order to estimate the value of the vaccination it is imperative that accurate information be acquired with regard to the child's state of health, especially if it is infected before being vaccinated.

New-born infants can as a matter of fact always be regarded as free from tuberculosis. On the other hand, if the child has lived for some time in a tuberculous

Table 1.—*Relation Between Dosage of Vaccine and Duration of Preallergic Period*

Quantity of BCG Injected, Mg.	Duration of the Preallergic Period, Weeks												
	2	3	4	5	6	7	8	9	10	11	12	13	17
1	..	2	..	1	..	..	..	..	..	..	..	..	..
0.5	1	1	..	..	..	..	..	..	..	..	..	..	..
0.25	..	..	2	..	..	.	..	..	..	..	..	..	..
0.1	..	1	3	8	10	4	2	..	1	..	3	..	1
0.05	..	..	3	4	10	9	3	2	..	1	1	2	..

surrounding the case is quite different. In such cases tuberculin tests will show whether or not the child has escaped infection. This can be determined only when the child has been separated from the source of infection for six or seven weeks. A negative tuberculin test after this period of quarantine will show that the child has not been infected. New-born infants and nonexposed children may therefore be vaccinated at once, but children who have been exposed to possible infection should be vaccinated provided they have shown themselves to be tuberculin negative after a lapse of from six to seven weeks from the date of their last exposure.

Calmette and his coworkers were of the opinion that vaccination with B C G produced a relative immunity without causing any tuberculin sensitivity. Now it is known that tuberculin sensitivity occurs just as well after a successful B C G vaccination as after a virulent infection. The only difference is that it is ever so much weaker and is possible of demonstration only by means of large doses of tuberculin. It is generally assumed that if immunity is acquired at all by vaccination it is present in those children who have become sensitized to tuberculin. Whether the immunity is already present before the tuberculin test has become positive is as yet unknown. When it comes to the question of deciding when a vaccinated child may be permitted to return to its tuberculous home it would

Table 2.—*Total Number of Children Vaccinated*

	Exposed	Not Exposed	Inoculated But Not Yet Tuberculin Positive	Unknown	Total Number
Living	228	120	0	0	348
Dead	2	3	2	0	7
Total number	230	123	2	0	355

be safest at all events to assume that the child has acquired this immunity only when it has become tuberculin positive. It is on this principle that we have acted in the experiments made at Gothenburg.

Under such circumstances it is a matter of great practical importance to determine when the sensitivity to tuberculin sets in after vaccination. Calmette was of the opinion that immunity does not occur until after a month's time and therefore recommended that the vaccinated child be isolated for this period. From data to be submitted later it will be seen that it is absolutely impossible in each separate case to determine in advance an exact period of one month's isolation. This is especially the case when employing the peroral vaccination recommended by Calmette. In this method the sensitivity to tuberculin occurs very late, usually not before the lapse of some months, sometimes not before six months or later, sometimes not at all. Sensitization is therefore a very irregular phenomenon, a fact which does not occasion surprise when one takes into consideration that the peroral method of vaccination implies such enormous variations in the size of the actually resorbed dose of vaccine.

For this reason it has been considered more appropriate to employ a technic of vaccination in which the effective dose can be determined in advance. This can be done by injecting the vaccine. In subcutaneous inoculations there frequently arise rather large and disagreeable abscesses. Of the various parenteral methods of vaccination my associates and I have therefore chosen the intracutaneous, thus ensuring that any eventual liquefaction of the focus of inoculation will be as small and superficial as possible. When an appropriate dose of vaccine is administered there never arise any unpleasant local reactions in intradermal vaccination. The focus of inoculation, which is hardly ever larger than a pea, undergoes only a slight liquefaction and heals entirely in the course of a few weeks.

The interval between the vaccination and the onset of the tuberculin sensitivity varies also in cases in which the vaccine is administered intradermally, but by

Table 3.—*Age of Exposed Children When Vaccinated*

Age of Vaccinated Children										
Months					Years					
0-1	1-3	4-6	7-9	10-12	1-2	2-3	3-4	4-5	5-6	Above 6
90	23	24	16	19	15	10	7	4	16	6

no means so widely as in peroral vaccination. The sensitivity to tuberculin occurs, too, in a more reliable and fairly constant manner. The larger the dose of vaccine the quicker does allergy occur as a rule. With a vaccine dose of from 0.5 to 1 mg., tuberculin sensitivity is obtained after from one to three weeks (table 1), with a dose of 0.25 mg. after four weeks, with 0.1 mg. after six weeks and with the dose of 0.05 mg., which is used at present, after about seven weeks. On reference to the table it will be seen that even with exactly the same dose of vaccine there are very great variations, ranging from four to thirteen weeks with a dose of 0.05 mg. of B C G. These variations are due to individual constitutional factors, for the variations are equally great even if precisely the same preparation of vaccine is used, the same dose, the same method of application and in children of the same age.

From what has been said it is therefore evident that there is no possibility of determining beforehand when a child will be immune after being vaccinated. Judging from the conditions of tuberculin sensitivity, the acquisition of a state of immunity takes an unequal length of time in different cases. As a rule it occurs in about seven weeks, but occasionally it takes a considerably longer time. Indeed, in some cases the child is so insensitive to the vaccine that it does not react, either locally or by means of tuberculin allergy, even after a period of many months. In such cases the injections have been repeated, sometimes with increasing doses, until the child has finally reacted.

As already pointed out, we have not considered the child vaccinated until it has reacted to tuberculin. Until that occurs the child is not permitted to be exposed to any risk of infection. To ensure this the children during the period of vaccination have been isolated in an institution or in a private home. All children have been subjected to such a tuberculin control after vaccination.

In Gothenburg, a seaport town with a population of 250,000, since 1928, every child considered by the municipal dispensary to be in danger of infection has been vaccinated. This dispensary is thoroughly informed of practically every family any member of which has an open pulmonary tuberculosis. With only a few solitary exceptions it has always been possible to induce the parents to consent to the vaccination of the uninfected children at home. When the parents have been informed of the danger threatening the child at home and that for the sake of diminishing this danger they must either separate the child from the tuberculous member of the family or have the child vaccinated, they have of course chosen the latter alternative. In my opinion, the work of tuberculous vaccination in a community should be managed in this way by the tuberculosis dispensary and should preferably be entrusted to a single person so that he will be in a position to supervise the whole work and to control the effect of the inoculations of the vaccine and the health of the vaccinated infants.

TABLE 4.—*Age of Exposed Children at Date of First Exposure*

Age of Vaccinated Children	Children Vaccinated 1st Year	Children Vaccinated After 1st Year
1½ months	6	
2 months	23	
3 months	16	
4-6 months	34	
7-9 months	35	
10-12 months	24	
1-1½ years	20	12
1½ 2 years	2	12
2-3 years	3	10
3-4 years	0	7
4-5 years	1	5
5-6 years	0	15
Above 6 years	0	5
Totals	164	66
	230	

Up to the end of December 1933 the number of children vaccinated amounted to 355. For various reasons, among others the death of the source of infection, 123 of these children had not yet been exposed to tuberculous infection after vaccination. Three of these 123 children have died and all three of them have been examined post mortem. The cause of death was congenital malformation of the heart with bronchopneumonia in one case, pertussis-pneumonia in the second case and influenzal pneumonia in the third case. In none of these cases was death due to the vaccination. Two other children died before the vaccination had conferred tuberculin sensitivity and therefore at the time of their death were not completely vaccinated. One of these children died from a hemorrhagic diathesis, probably sepsis, the other from bronchopneumonia. The children just mentioned are the only ones of those inoculated up to the present who have died and who had not yet been exposed to tuberculous infection. Of the children who had been exposed, only two died; I shall refer to these deaths later.

Thus, altogether, only seven of the 355 inoculated children have died (table 2). Although this small number of deaths is in itself sufficient proof that the vaccination does not constitute any serious danger to the children, the following particulars are still more instructive: Out of 117 children who were vaccinated at birth and who at the last after-examination were at least 1 year of age, only four had died in their first year of life. This corresponds to a mortality rate among infants of only about 3 per cent. The method in which we have organized the work of antituberculous vaccination, by caring for the children in an institution or private home during their early life until the vaccination has taken has accordingly not involved any increased risk for the child. That the infants' state of health has been so good is no doubt due to the fact that they were nursed at an institution in which they could be fed on breast milk.

TABLE 5.—*Duration of Exposure*

Exposure of Vaccinated Children	Children Exposed During 1st Year	Children Exposed After 1st Year	Sporodic Exposure
2- 3 months	5	5	0
4- 6 months	12	7	2
7- 8 months	3	2	0
10-12 months	17	10	4
13-18 months	20	21	1
19-24 months	16	18	3
25-36 months	19	8	1
37-48 months	19	7	0
49-60 months	14	7	0
61-72 months	8	1	0
Totals	133	86	11
		230	

In regard to the living children, numbering 120, who have not yet been exposed, it should be mentioned that at the periodic reexaminations they were all in good health. They were still living in their homes, so far free from tuberculosis, or were accommodated in the homes of healthy families or were admitted to an institution.

The children who are of most interest are, of course, those who have been exposed to tuberculous infection after being vaccinated. In the following remarks I shall confine myself entirely to these 230 children. The ages of these exposed children at the time of vaccination will be seen in table 3.

TABLE 6.—*Result of Last After-Examination (December 1933)*

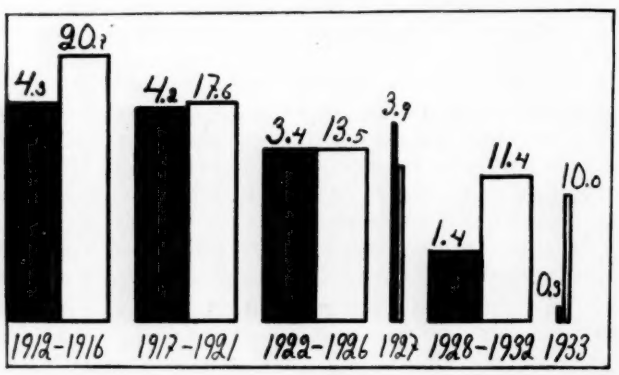
Results of Roentgen Examination of Children Alive at After-Examination					Postmortem Examination of Dead Children		
Very Large Hilus Shadow	Moderately Enlarged Hilus Shadow	Slightly Enlarged Hilus Shadow	Suspected Enlarged Hilus Shadow	Normal Roentgenogram	Died From Tuberculosis	Died From Other Diseases	Total
0	1	4	7	216	0	2	230

Fully one third of all the children were vaccinated shortly after birth, while but a small number were vaccinated during school age. Thus, vaccination has been performed chiefly on infants and preschool children. In order to form an estimate of the degree of protection that a vaccination may be expected to afford, it is important to know the age at which the exposure to infection began. The earlier a child contracts a virulent infection the more serious does the tuberculous disease in general tend to be. Since, under the most favorable conditions, sensitivity to tuberculin is delayed

for about one and one-half months after vaccination has been performed, it is obvious that no child has been exposed until the expiration of this time. This feature is in itself a very great gain in a prophylactic respect. For various reasons quite a number of the vaccinated children were kept away from their tuberculous homes for a still longer period. I should like to point out that we have not, of course, urged that a child be returned to its home immediately after the vaccination has taken. On the contrary, we have tried to induce the parents to wait as long as possible before taking the child home. The time at which the children were first exposed to infection appears in table 4.

It will be seen from this table that only six children were exposed to the risk of infection at the age of 6 weeks, forty-five were exposed under the age of 3 months and seventy-nine under the age of 6 months; that is, nearly half of the children were vaccinated before 1 year of age. On the other hand, the exposure of some of these children was delayed until they were more than 2 years of age.

Another thing that is important for the effect of a tuberculous infection is the duration of the exposure. Here, too, the prognosis differs in the case of a child who has been exposed to infection ever since infancy



Death rate from tuberculosis among infants per thousand (black columns) and from pulmonary tuberculosis among adults per 10,000 (white columns) in Gothenburg during the years 1912-1933, arranged in five year periods.

from that in a child who is exposed at a later age. The duration of the exposure is seen in table 5.

The shortest period of exposure was fixed at two months. This was done in view of the fact that any eventual tuberculous changes produced by a virulent tuberculous infection cannot be demonstrated until the end of the tuberculous incubation period, about six to seven weeks. Hence children who have been exposed for less than two months after being vaccinated have been regarded as nonexposed. Nearly three fourths of all children exposed during the first year of their lives have been exposed for a period of more than twelve months and some of them up to from six to seven years. Owing to the fact that many of the sources of infection died one after the other, the number of children exposed for very long periods consequently become fewer and fewer in proportion. The children which have only been exposed sporadically have been recorded separately. Usually the risk of a sporadic exposure is not so great as that of a daily one. Several of the children recorded as being continuously exposed have, in addition to the period of exposure shown in table 5, been exposed sporadically at certain times.

All vaccinated children are examined at least once a year and are besides kept under the regular supervision of the dispensary. As soon as a child exhibits any symptoms of disease it is at once sent for a control examination in addition to the annual reexamination.

In judging the health of a child vaccinated with B C G regard must be paid chiefly to tuberculous disease. In the case of an unvaccinated child a positive tuberculin reaction constitutes an important support for the diagnosis of tuberculosis. In the case of a vaccinated child, on the other hand, no diagnostic significance is to be attached to a positive tuberculin reaction; all children successfully vaccinated with B C G are sensitive to tuberculin.

If the virulent infection, which sooner or later takes place by way of the respiratory passages in a vaccinated child exposed to tuberculous infection at home, should lead to so violent a reaction that anatomic changes arise, these lesions will be found, with but few exceptions, to be intrathoracic. These foci do not usually present any physical symptoms but may be demonstrable by roentgen examination. The only possibility of forming an objective conception of a vaccinated child's state of health as far as tuberculosis is concerned is therefore by means of a roentgen control. An after-examination that is not based on such a control is unreliable and is of no real value from the point of view of morbidity.

All children vaccinated with B C G at Gothenburg who have been exposed after the vaccination to the risk of infection have been examined roentgenologically at least once a year. The results of these after-examinations are seen in table 6. Only one of the 230 exposed children exhibited roentgenologically an infiltration of the hilus of a decided tuberculous character.

This patient was a boy, whose father and a grown-up brother had open pulmonary tuberculosis. The child had been vaccinated shortly after birth and was returned home after the completion of the vaccination. He was then 6 months old. After an exposure of six months he became ill with fever and displayed symptoms of a catarrhal condition of the upper respiratory passages. The roentgen examination showed a density of the hilus and the lower part of the right lung. Virulent tubercle bacilli were discovered in the fluid obtained by gastric lavage, and the diagnosis was clear. The densification was the manifestation of a tuberculous process produced by a virulent infection which the child had contracted at home.

The tuberculous process presented by the boy was remarkably benign. He became afebrile after a week and his general condition was never affected. Although he passed through a whooping cough during his stay at the hospital, he was discharged after five months. Subsequently roentgen examinations have disclosed a rapid disappearance of the densification of the hilus, so that a year after its manifestation the roentgenogram showed an almost normal condition. I may add that this boy's sister, aged 6 years, who had not been vaccinated, was also infected at about the same time after a short visit at home. There resulted an extensive infiltration of the right hilus, for which she had to be nursed at the hospital an entire year.

In four cases the hilus pictures were slightly larger than normal but in three of them the patient had had pertussis or pneumonia before the examination, and not one of these four children had exhibited any symptoms suggestive of a manifest primary tuberculosis. In seven of the cases it was not possible to decide from the roentgenogram whether the hilus shadow was normal or not. In the remaining 216 children alive at

the time of the last reexamination the roentgenograms showed absolutely normal conditions.

Only two out of the 230 children exposed have died, neither of them from tuberculosis. One of the two died from an epidemic meningitis after an exposure of one and three-fourths years. No signs of tuberculosis were found at autopsy. The other child succumbed to an acute pneumonia and diaphragmatic hernia after an exposure of six months. At autopsy no tuberculous disease was discovered.

As to the value of the statistics of the after-examinations, not a single one of the vaccinated children missed the examination. Every one has been controlled and therefore there is no child in my material whose fate is not known.

There is no possibility of determining the manner in which the immunity acquired by means of the vaccination has influenced the results. We have no control material of unvaccinated children who have lived under the same conditions as the vaccinated ones. Even other factors besides a specific resistance may have been active. Attention has already been called to one such important factor: the children were not exposed during their earliest age, and in many cases the exposure was delayed until after 1 year of age and even later. Another favorable factor is the increased interest in the prophylactic measures against tuberculosis shown by the parents of the vaccinated child, thanks to the educational work of the dispensary nurses while the children are being vaccinated. Under the influence of this instruction the parents do everything in their power to prevent severe infections of the children and avail themselves of the prophylactic means at their disposal.

The effect of all these favorable factors contained in the method of vaccination employed can be seen by comparing conditions prevailing when this system was not in use. As already stated the vaccinations have been made at the request of the dispensary. It was also pointed out that this dispensary supervises nearly all tuberculous families in the town and is informed of all children exposed to infection in such families. Attention was finally called to the fact that practically all infants exposed to the risk of infection, but so far uninfected, have been vaccinated. Since deaths from tuberculosis among infants as a rule occur among those in infectious surroundings, this attempt at the reduction of tuberculosis, aimed at by these vaccinations, must have an effect on the total death rate from tuberculosis in infancy in Gothenburg. This is really the case. A prophylactic measure, such as the one described here, cannot of course prevent every death from tuberculosis occurring among infants. Those children who have been infected before the discovery of the source of infection cannot be protected and some of them die from tuberculous disease.

The result of the prophylactic vaccination introduced in 1927 can be seen from the chart, in which, arranged in five year periods, the absolute number of deaths per thousand from tuberculosis among infants in Gothenburg is shown. In the three five year periods immediately preceding 1927 the death rate was 4.3, 4.2 and 3.4 per thousand, respectively. In 1927, which was a year of transition with but a relatively small number of vaccinated children, the mortality amounted to 3.9 per thousand. After 1928 it can be considered that the principles advanced here have been strictly applied. The rate of mortality during this five year period was only 1.4 per thousand; that is, about 60 per cent less than during the preceding period. In 1933, the first year in the next five year period, the death rate was only 0.3 per thousand. It should be noted that the general tuberculosis death rate, especially from pulmonary tuberculosis, has not shown the same downward tendency. This signifies that the number of the sources of infection has not, broadly speaking, decreased in proportion to the decrease in the number of deaths from tuberculosis in infants.

The course of this mortality curve furnishes conclusive proof that the principles on which we have been working have been efficacious in a purely practical application of B C G vaccine as a prophylactic measure against tuberculosis in the infants of a community. What has been possible for us to achieve should also be attainable elsewhere. The main condition of success is that the work of the dispensary of the community should be based on sound principles and that it has full information about the tuberculous homes. Further, it is essential that vaccination with B C G be performed in such a manner that an immunizing effect can be obtained before the children are exposed.

Gothenburg Children's Hospital.

THE TREATMENT OF EXTENSIVE MALIGNANT LESIONS OF THE STOMACH

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It is difficult to define "extensive" carcinoma of the stomach, for a very small, apparently localized, carcinoma no larger than 1.5 cm. in diameter may be of very high degree of malignancy, and it may cause involvement of the lymph nodes along the greater and lesser curvatures of the stomach that necessitates removal of an extensive portion of the stomach and its attached omentums containing the involved lymph nodes. Were it not for the varying degrees of malignancy, extensive malignant tumors of the stomach might be defined as those which, because of their size, necessitate removing an unusually large part of the stomach and, in some cases, even the entire stomach; or those which because of frequent attachment of the carcinoma to adjacent structures, such as the capsule of the liver or pancreas, or because of involvement of the transverse mesocolon, require that portions of these structures also be removed.

Not uncommonly, in this group of cases, preoperative clinical and roentgenologic examination of the stomach may give the impression that the lesion is inoperable but, at exploration, removal may be found to be not only possible but also justifiable. Last year, at the clinic, 126 patients were operated on for carcinoma of the stomach. In 62.6 per cent of cases the lesion was removed by partial or by total gastrectomy. In thirty-seven of these cases the carcinoma was very extensive, and fluoroscopic and roentgenographic examination seemed to indicate that the lesion was of doubtful operability or was wholly inoperable; yet, in nineteen of the thirty-seven cases, the lesion was removed successfully. The corollary of this should be, I think, that every patient who has a malignant lesion of the stomach and whose condition warrants an abdominal exploration should be given the opportunity

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unless definite evidence of incurability or of remote metastasis is present. I would estimate that, in at least 10 to 15 per cent of cases in which the lesion on roentgenologic examination would appear to be inoperable because of its extent, surgical removal of the lesion can be accomplished. Large malignant lesions of the stomach often will be found to be of a low degree of malignancy, to be sharply demarcated, and to present no glandular involvement; removal of such lesions by partial gastrectomy gives a high incidence of permanent cure, and this particularly is true in cases in which patients are elderly.

Progress that has been made in the treatment and curability of carcinoma of the stomach can be attributed, among other things, to (1) greater recognition of the fact that early symptoms may be insignificant, (2) increasing efficiency with which the competent roentgenologist can identify even the smallest gastric lesions, thus permitting earlier and complete removal, (3) a working hypothesis that every gastric lesion may be malignant unless proved otherwise, and (4) extension of the field of operability to include extensive carcinomas that heretofore might have been regarded as being on the borderline of operability.

VALUE OF THE ROENTGENOGRAPHIC EXAMINATION

The value of the roentgenographic examination in cases of small carcinomas of the stomach is strikingly illustrated in two cases. In the first case, that of a man aged 32, the presence of a small ulcerating lesion, measuring 1.9 by 1.7 cm., was detected by the roentgenologist and diagnosed as an ulcerating carcinoma because of the meniscus sign of Carman. At operation, with the lesion between my exploring fingers, I could not distinguish it from a benign lesion. Microscopic examination following gastric resection revealed it to be a carcinoma of grade 3. Some time ago I operated on a patient who had a small ulcer of the lesser curvature of the stomach; this ulcer had recurred two years after reported local excision of a gastric ulcer elsewhere, and symptoms had recurred. The roentgenologist reported a gastric ulcer with a small crater. At operation, the lesion appeared grossly to be a benign gastric ulcer, with a round, smooth crater approximately 1 cm. in diameter. Gastric resection was performed, the Billroth I-Haberer anastomosis being used to restore continuity between the stomach and the second portion of the duodenum. Although on gross examination the lesion appeared to be benign, a few minutes later a report of microscopic examination indicated that it was a carcinoma.

In the first of these cases the roentgenologist was correct in his declaration that the lesion was malignant but, in the second case, it was not known that the lesion was malignant until it had been so reported on microscopic examination. Of a group of eighty-two cases taken at random, in which patients were operated on at the clinic in 1933 and in which a preoperative clinical and roentgenologic diagnosis of gastric ulcer was made, in seventeen cases, or 20 per cent, the lesion was found to be carcinomatous, and in eleven of these seventeen cases the lesion was inoperable owing to its extensiveness or to metastasis. Carcinoma of the stomach can be detected by a competent roentgenologist in 95 per cent of cases, and roentgenographic examination of the stomach of patients 40 years of age or more who have indeterminate dyspepsia is the most important procedure in the examination, and it never should be omitted in any suspicious cases. In the absence of the meniscus sign, the roentgenologist cannot determine whether the ulcer is benign or a small ulcerating carcinoma. For this reason, every gastric lesion should be regarded as being malignant or potentially so until proved otherwise.

There is no denying the fact that many small benign gastric ulcers, particularly those of short duration, may heal completely under a properly conducted medical regimen. However, such a method of treatment should not be instituted unless the patient can be kept under constant observation for several months to eliminate, subsequently, the possibility of malignancy. McVicar, several years ago, called attention to the fact that an ulcerating lesion of the stomach that disappears following a course of medical treatment cannot always be assumed to be benign, and he drew attention to the fact that many patients with ulcerating lesions of the stomach responded temporarily to medical treatment even when the process was malignant. The decision to treat a patient with an ulcerating gastric lesion by medical measures carries a great responsibility, for, if the lesion is malignant, by the time it is found to respond unsatisfactorily to medical treatment sufficient time may have elapsed for it to have become completely unremovable. The large gastric ulcer, even though benign, usually is of the callous or penetrating type, extending through the gastric wall either into the pancreas or into the gastrohepatic omentum. The possibility of curing such a lesion by medical measures is small; indeed, the possibility that the lesion is malignant is much greater.

I have mentioned this problem of the small gastric ulcer because it seems to me that the recognition of the fact that it frequently is malignant, as likewise may be other small lesions of the stomach such as polypi, will frequently enable an earlier attack to be made on such lesions while they are in stages most favorable for cure. If further progress is to be made, therefore, in securing a larger proportion of three and five year cures in cases of carcinoma of the stomach, every effort must be made to recognize the presence of malignant gastric lesions in their earliest stages before extension of the lesion has occurred.

Just as roentgenologic examination is of great value in the localization of small gastric lesions, so also is it equally valuable in cases of more extensive lesions. In the interpretation of roentgenograms in such cases it must be remembered that the roentgenographic film may present a shadow which would indicate deformity but that this deformity may be the result of other intrinsic, benign gastric lesions, such as foreign bodies, leiomyomas, polypi and large, penetrating, benign gastric ulcers, and that most of these lesions are benign and removable. Certain extrinsic lesions, such as are associated with empyema of the gallbladder or cyst of the pancreas, often produce deformity of the stomach suggestive of a gastric lesion. In either of these groups, if a large portion of the stomach appears involved on roentgen examination, the lesion might be regarded as inoperable and malignant unless exploration is done.

EXTENSION OF THE FIELD OF OPERABILITY OF MALIGNANT GASTRIC LESIONS

In general, I believe that an increasing number of extensive malignant lesions of the stomach are being removed. This has partially been due to the fact, as I mentioned previously, that every patient who has a lesion of the stomach, no matter how extensive that

lesion appears to be, is never denied the possible benefits of an abdominal exploration, provided his general condition permits it and provided remote metastasis is not demonstrable. The finding of an extensive carcinoma localized in the stomach, or even of one with associated glandular involvement, is viewed from the standpoint that unless the lesion is removed the patient is doomed to an early death. On the other hand, Balfour has shown that, when the disease is still confined to the stomach, 50 per cent of patients who have a carcinoma of the stomach which potentially is removable have lived for three years or longer following partial gastrectomy, and that, even when extragastric glandular involvement has taken place, 19 per cent of patients have lived three years following resection.

In several cases total gastrectomy has been performed successfully at the clinic, and patients have lived and been comfortable two and three years subsequently. That such an operative procedure can be carried out in suitable cases with great benefit to the patient has led to the impression that all gastric lesions should be removed unless they have invaded adjacent structures to the extent that the carcinomatous process cannot be removed in its entirety. At operation, in many instances in which the lesion at first would appear to be insusceptible of removal because of its extent and attachment to the mesocolon and to the capsule of the pancreas or liver, it is found that, after freeing of adhesions and separating the lesion from these structures, the growth is readily removable. In other cases, particularly if the tumor is large, the uninvolved portion of the stomach may be thickened to give the appearance of involvement, yet the thickening may be only the result of gastritis adjacent to the lesion. It is not an uncommon experience to find that a growth which is examined while the patient is straining under light anesthesia appears to be unremovable but under deep anesthesia may be seen to be readily removable. In several cases involvement of the transverse mesocolon has given, at first, the appearance of inoperability, yet it usually is the avascular portion of the mesocolon that is involved, and this portion can be removed with the carcinoma without interfering with the blood supply of the colon.

THE INFLUENCE OF AGE ON OPERATIVE RISK

I believe it is worth while emphasizing to patients in the sixth, seventh or even eighth decade of life that they frequently stand operative procedures of great magnitude as well as younger individuals. One of the two successful total gastrectomies I have performed for carcinoma was in the case of a man 68 years of age, and he was living and well two years later. Two years ago I performed subtotal gastrectomy in a case in which the patient was 80 years of age, and he has been free of recurrence since that time. I recall many cases in which patients in the sixth and seventh decades of life were operated on successfully and in which extensive gastric resections were carried out successfully with a risk no greater than that attending resections of average extent among much younger patients. A corollary of this is that it is not the age of the patient but his general condition that is a factor in the surgical mortality.

TECHNICAL PROCEDURES ASSISTING IN THE REMOVAL

I have found it of value to approach all extensive lesions of the stomach through a left rectus incision. Such an approach enables one to attack the upper part of the stomach with much greater ease than through an incision in the median line. Resection is begun by dividing the duodenum just below the pyloric sphincter and by reflecting the stomach upward, removing all of the gastrohepatic omentum and as much of the gastrocolic omentum as may be indicated to a point well above the lesion. If it is desired to perform a Polya type of anastomosis, the jejunum is sutured to the posterior wall of the stomach at this high level before the growth is removed, which enables one to remove a large part of the stomach or even the entire stomach when necessary, with greater ease and safety than by removing the lesion first, using a crushing clamp to close temporarily the proximal end of the stomach. Among fleshy individuals particularly, removal of all the gastrocolic omentum to the site of resection assists materially in the ease with which reconstruction anastomosis can be carried out and, at the same time, more completely removes any involved glands along the greater curvature.

In general, a posterior Polya, or an anterior Polya-Balfour, type of anastomosis is the most satisfactory type of reconstruction following extensive gastric resection for malignant disease. However, in certain instances I have found that the original method of Billroth, in which the stomach is anastomosed to the duodenum, has worked out to advantage, although the greatest field of its applicability is with benign, gastric ulcers, bleeding duodenal ulcers, and with recurring ulcers. This particularly is true of small lesions localized high on the lesser curvature of the stomach, the removal of which can quite readily be effected by removal of a larger portion of the lesser curvature and its omentum. By preserving a larger amount of the greater curvature of the stomach, anastomosis to the duodenum directly requires less time than the Polya anastomosis, and there is one less area for suturing. When extensive gastric resections have been performed on elderly patients, particularly in the case of subtotal or total gastrectomy, jejunostomy as a means of providing a temporary method of feeding has a decided advantage, as nourishment can be administered directly into the jejunum through a tube for as long a time as necessary; during this time oral administration of fluids is restricted to assist in healing the anastomosis. This is of particular value for patients who have lost a considerable amount of weight and who have been debilitated as a result of carcinomatous obstruction.

SUMMARY

Because of the varying degrees of malignancy of carcinomatous lesions of the stomach, probably all malignant gastric lesions should be regarded as extensive, for the very small lesion may be highly malignant and produce glandular involvement and a larger lesion may be of a low degree of malignancy and produce no glandular involvement. Since very large malignant lesions of the stomach are usually localized in the stomach and frequently are of a low degree of malignancy, it is quite necessary that every attempt be made to remove them. Frequently such lesions, in the preoperative clinical examination, particularly in the roentgenologic examination, may appear to be, because of their size and extent, inoperable; yet on abdominal exploration these lesions frequently can be removed successfully. In addition, the fact that certain other intrinsic gastric lesions, such as polypi, large gastric ulcers or foreign bodies, as well as some few extrinsic

lesions, may deform the stomach to the extent that the lesion appears malignant and inoperable, even though it is benign and removable, emphasizes further the value of abdominal exploration. The finding of an extensive carcinoma localized in the stomach, even when there is associated glandular involvement, is viewed from the standpoint that unless the lesion can be removed the patient is doomed to an early death. It is felt that such a patient should not be denied the benefit of surgery if it is possible to remove the growth. Balfour's report of 50 per cent three year cures in cases of removable gastric lesions without glandular involvement and of 19 per cent three year cures in cases of very malignant lesions with glandular involvement emphasizes the great value of surgical removal of all gastric carcinomas.

Technical procedures assisting in removal of extensive gastric lesions are to approach the stomach through a left rectus incision, to begin resection by dividing the duodenum below the pylorus, and to complete the posterior portion of the gastrojejunal anastomosis to the posterior wall of the stomach high above the lesion before the latter is removed. This enables a larger segment of the stomach to be removed. A temporary jejunal stoma for feeding has permitted administration of nourishment into the intestinal canal during the postoperative period in which healing of the anastomosis is taking place. If further progress is to be made in securing a larger proportion of cures in cases of carcinoma of the stomach, every effort must be made to recognize the presence of malignant gastric lesions in their earlier stages, and in this roentgenologic examination of the stomach is of the greatest assistance. Competent roentgenologists have been able to identify accurately and to localize a polypoid or an ulcerating gastric lesion as small as 1 cm. in diameter.

ABSTRACT OF DISCUSSION

DR. FRANK H. LAHEY, Boston: In discussing carcinoma of the stomach, one must always assume the position that the diagnosis of this condition is too frequently late, owing to the fact that the symptoms are of such a silent character. Progress in this condition will not be made until symptoms can be investigated by bismuth subnitrate roentgenograms oftener and earlier. One thing that always comes up is the question of malignant degeneration of ulcer. There are certain points about these cases that are now quite settled. One is that 100 per cent of the lesions on the greater curvature are malignant. I do not hesitate to submit lesions in this location to immediate surgery. The next location in which malignancy is common is the prepyloric region. The closer to the pylorus on the gastric side the lesion is, the greater is its tendency to be malignant. Lesions in this region, however, are easily misinterpreted because prepyloric spasm is very common and I have twice found no lesion on exploration. Prepyloric spasm closely simulates a malignant condition. Another point of value to discuss is the type of malignancy that involves the whole stomach and appears inoperable. One sees two types of cancer of the stomach: one, the lesion that involves the serosa, particularly on the lesser curvature, and this very quickly metastasizes into immediate and distant lymph nodes; the other type, the so-called leather bottle stomach, the linitis plastica type. Microscopic examination reveals two different types of cancer distribution. In the linitis plastica type the cancer cells tend to stream down between the muscle bundles and in this way they are disseminated through the entire gastric wall. They tend to expend their energy in this type of carcinoma not in distant metastases. In the other type of carcinoma, the localized type, the carcinoma cells are localized to the lesion but extend out in the lymphatics and do tend to metastasize early. Not infrequently, therefore, one sees almost complete involvement of the stomach by the linitis plastica type of carcinoma without metastasis in the liver and without metastatic lymph nodes. I think these are the cases particularly in which total gastrectomy is best indicated. My associates and I have had three successful total gastrectomies. Dr. Clute had one and I had two. As one becomes adjusted to some of the technical difficulties of this operation and if the cases are well selected, it is distinctly a reasonable and possible procedure but will frequently, of course, as Dr. Walters has already stated, be disappointing in the long run because of recurrences due to the extensiveness of the lesion. Nevertheless, when I recall that Dr. Clute's successful case had been repeatedly rejected elsewhere as inoperable but, following a total gastrectomy, the patient worked every day and lived in comfort for three and a half years, this operation becomes, in my mind, definitely justifiable.

DR. GATEWOOD, Chicago: Until some new light is shed on the treatment of carcinoma, extensive gastric resection will continue to be a necessary procedure. Neglect will always play a part, but in spite of all that lay cancer education and periodic health examination can do, gastric cancer frequently sneaks up on its unsuspecting victim so silently that it is extensive before he has any warning. Theoretically, more than three fifths of gastric cancers should be amenable to eradication by surgery. Practically, less than one fourth can be removed. How are results to be improved? First, by more careful heeding of any vague gastric symptoms in the patient past 40 (thereby making earlier diagnoses) and, secondly, by improving therapy. Reviewing the last twenty-five consecutive hospital deaths following gastric resection done for carcinoma, I find the following causes: I. Peritonitis, eight cases. A. General. B. Local, as subphrenic abscess. II. Pneumonia, eight. III. Cardiac failure, two. IV. Shock, three. V. Hemorrhage, one. VI. Pneumothorax, one. (This patient died rather suddenly several hours after total gastric resection. Autopsy showed that, by retching, a small opening had been blown in the suture line. As the diaphragm had been used to reinforce the suture line, the swallowed air was forced into the thoracic cavity). VII. Inanition, one. VIII. Pulmonary metabolism, one. It was found that the absence of free acid definitely increases the operative risk, owing to the great increase in bacterial flora. While I have not been able by my own microscopic studies to confirm Bloomfield's statement that absence of hydrochloric acid is due to gastritis, tissues are definitely more friable and the mortality greater in the achlorhydria case. To reduce hospital mortality, careful preoperative preparation is most essential. A week can often be well spent in bringing up the patient's fluid balance, in repeated blood transfusions and in feeding the patient small amounts of highly nourishing foods at frequent intervals. Drachm (4 cc.) doses of dilute hydrochloric acid given from three to five times a day are, I believe, of definite value in reducing the bacterial content of the stomach. Gentle lavage by the Levine tube except in cases of active bleeding aids in preparation as well as accustoming the patient to a procedure that may be of life-saving value later. In selected cases I have inserted the tube under the fluoroscope postoperatively, obviating the necessity for jejunostomy. Earlier diagnosis and more technical skill are of great importance, but physicians should not forget to direct attention toward more careful preoperative and postoperative care.

DR. J. TATE MASON, Seattle: I have had occasion within the last two years to do two total gastrectomies, which have called attention to several outstanding technical advantages in certain operative procedures. First, if the surgeon is able to do a total gastrectomy at all it is a relatively easy surgical procedure in that individual. The patient with a large frame, who has lost considerable weight, is of course much easier to operate on than the short, thick, heavy-set person, in whom exposure is always difficult. The operation is greatly simplified by following Dr. Walters' method of using the stomach, after it has been thoroughly detached, as a lever to pull down on while making the posterior anastomosis between the esophagus and the jejunum. I have in the past classified certain patients with cancer of the stomach as inoperable, because of their clinical and roentgenologic appearance, who should have been given the chance that exploratory operation affords. Both my

patients made uneventful recoveries. One lived very comfortably for twelve months and then began to have symptoms of recurrence and died in fourteen months. The other patient was operated on too recently for a report. I know of no operation in the abdominal cavity in which one needs more exposure than in a total gastrectomy. Particularly is this true in certain individuals. I have for years used a zigzag incision, which gives the greatest amount of exposure that I have ever seen through any abdominal incision, in which no nerves or muscle fibers are severed, and which, when closed with a little care, gives as few postoperative hernias as any incision I have seen. The incision begins high up on the left rectus and passes down in this muscle to just above the umbilicus and then is carried across to the opposite side and down on the right rectus a short distance, depending on the amount of exposure one wishes to obtain. The anterior sheath of the left rectus is then opened on its inner third, the muscle fibers containing the blood supply and nerve supply rolled to the other side. Just above the umbilicus the fascia is cut straight across, and the same procedure is followed on the right rectus below the level of the umbilicus, the muscle being rolled to the other side. In closing this incision, one closes the transverse part first, which is usually imbricated, making the fascia even more secure and tight than before operation.

DR. J. SHELTON HORSLEY, Richmond, Va.: The only cure for gastric cancer is excision, so the problem of treatment is simple. There are a few cases of small, round-cell cancer of the stomach and cases of lymphosarcoma which respond to irradiation, but they are rare. As a practical therapeutic measure, excision of a gastric cancer is the accepted treatment. It is obvious that the diagnosis and resection should be done early, but the majority of cancers of the stomach are seen only in the advanced stages and they demand earnest consideration. The statement by Dr. Walters that almost all gastric cancers should be explored is important. Naturally, when there is ascites, or Virchow's glands, at the root of the neck, or when masses in the culdesac can be felt by rectal examination, exploration is contraindicated. But without these signs of hopelessness, even though an experienced roentgenologist says that he thinks the lesion is inoperable, exploration is often justified. I have had several cases in which the roentgenologist pronounced the lesion inoperable and in which I was able to make a resection. A few of these patients have at least had their lives prolonged, all otherwise being doomed. The administration of large quantities of dilute hydrochloric acid, a physiologic antiseptic, is valuable. This, with intravenous dextrose in Ringer's solution, will frequently convert into a potentially safe recovery a case that otherwise seems desperate. A resection may often be done in the presence of adhesions or invasion of the adjacent viscera, or even in the presence of small metastases in the liver. It not only removes the cause of obstruction, frequently a necrotic cancerous mass, but likewise gives a free exit to the stomach contents. I doubt whether gastroenterostomy really has any place in the treatment of cancer of the stomach, because if this is the only operation that can be done because of the extent of the lesion, a gastro-enterostomy will afford no real relief. Pathologists have shown that about 23 per cent of all deaths from gastric cancer show the lesion still limited to the stomach. The small amount of resectability that is reported from the hospitals suggests that chances should be taken in many cases that seem inoperable. If 23 per cent of gastric cancers at necropsy are confined to the stomach, there certainly should be a still larger percentage limited to the stomach when the patient comes for diagnosis.

DR. J. W. THOMPSON, St. Louis: I wish to stress a point that has not been emphasized and that is the frequency of the extension of these carcinomas onto the transverse colon. The decision as to the operability of the lesion on abdominal exploration is frequently based on the extension of these peritoneal implants from the original growth. About three years ago I had occasion to perform an extensive subtotal resection on such a patient and at the same time I made a primary end-to-end anastomosis after resecting 6 inches of the transverse colon. This man has lived three years in comfort. The colon can be resected successfully at the same time that the stomach is resected.

THEORY AND PRACTICE OF PARENTERAL FLUID ADMINISTRATION

ALEXIS F. HARTMANN, M.D.
ST. LOUIS

In the early stages of undue loss of water from the body, regardless of the cause of such loss, the composition of the blood in respect to its water content and electrolyte pattern tends to remain unaltered because of the stabilizing or buffering effect of the intercellular fluid of the body. This portion of the body may be looked on as a reservoir which may shrink appreciably in order that changes in the blood and perhaps also in the fixed tissue cells may be kept at a minimum. When, however, the intercellular fluid becomes exhausted, changes do appear in the blood indicative of this exhaustion, and probably also in the fixed tissues themselves. The nature of the changes is largely dependent on the manner in which fluid is lost; sometimes acidosis may accompany dehydration, at other times alkalosis, while occasionally a tendency toward one such change may be almost exactly balanced by a tendency in the opposite direction (chart 1). Also, during a period of excessive fluid loss leading to dehydration, the groundwork for subsequent edema may be laid.

By chemical examination of the blood one can usually obtain undeniable proof of loss of water, chloride, bicarbonate and total fixed base. Loss of other substances, however, such as potassium and calcium, are not usually so indicated, as their concentrations in the blood plasma tend to remain quite fixed, the tissue cells and the bones acting as reserve depots. These facts should be borne in mind when efforts are to be made to replace lost intercellular water, so that restitution may be chemically adequate. Thus, it is frequently necessary to replace lost electrolytes along with water, if the effects of dehydration are to be overcome completely. It may also be necessary to restore plasma protein, or at least to make more normal the colloidal osmotic pressure of the blood in order to reestablish a normal circulation of the blood and a normal interchange of substances between the blood and the intercellular fluid.

In order to accomplish such a purpose without too much reliance on the aid which renal activity may afford or on the aid with which absorption of food from the intestinal tract may provide, it may be necessary to give parenterally fluids that are quite similar to normal intercellular fluid, or at least to provide the most essential mineral constituents of body fluids. Sodium chloride is the most important salt as far as amount is concerned. It is to be expected, therefore, that administration of isotonic sodium chloride solution should go far toward relief of the phenomena of dehydration. Sodium chloride alone, however, frequently is insufficient to provide complete relief of symptoms.[1] The addition of potassium and calcium is at least theoretically indicated, and when such an addition is made in the same proportion in which these elements exist in blood plasma or intercellular fluid, Ringer's solution

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Read before the Section on Pediatrics at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 15, 1934.

1. Hartmann, A. F.: Chemical Changes Occurring in the Body as the Result of Certain Diseases: I. The Effects of Diarrhea, Vomiting, Dehydration and Oliguria on the Acid-Base Balance of the Plasma of Infants with Mastoiditis, Am. J. Dis. Child. **35**: 557 (April) 1928; Acidosis, Alkalosis and Ketosis, in Brennemann's Practice of Pediatrics, Hagerstown, Md., W. F. Prior Company, Inc., volume 1, section 2, chapter 1.

results. Still more perfect imitations would be such modifications of Ringer's solution as Locke's and Tyrode's solutions (chart 2).

It should be noted, however, that in both of these solutions the amount of bicarbonate present is much less than in normal blood plasma or intercellular fluid. This is necessary because of the fact that calcium bicarbonate would precipitate if more were to be added. Such solutions, therefore, are not greatly superior to the original Ringer's solution when restoration of diminished bicarbonate (acidosis) is desired. That such a restoration frequently follows the administration of such solutions is admitted, but the reason is not inherent in the solution; it is concerned with secondary effects in improving the circulation and stimulating renal activity. The bicarbonate content of the blood and body fluids, however, can be quite readily restored and maintained by controlled and separate injections of sodium bicarbonate and Ringer's solution. Still more conveniently and just as effectively, the same end may be accomplished by substituting sodium lactate for sodium bicarbonate.[2] When such a substitution is made, sodium lactate may be combined with Ringer's solution, with which it is compatible.

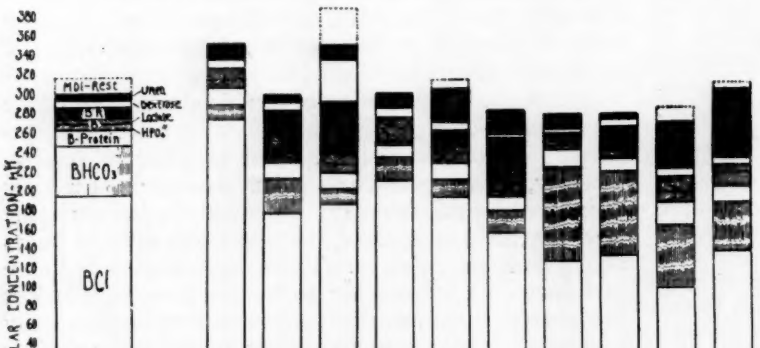

Chart 1.—The more common types of chemical changes in the blood plasma in conditions that usually require parenteral fluid administration.

The solutions that I have found necessary or desirable in various conditions include (1) Ringer's solution (hypotonic), (2) sodium lactate (isotonic and hypotonic), (3) lactate-Ringer's solution (physiologic buffer salts solution), (4) dextrose solution (isotonic, hypertonic and hypotonic, when in combination with Ringer's solution or lactate-Ringer's solution), (5) sodium bicarbonate, (6) artificial "spinal fluid," (7) acacia solution, and (8) citrated whole blood or plasma. The composition of these fluids, the methods of their preparation, their specific indications and the manner in which they are to be administered will next be considered.

METHODS OF PREPARATION

Ringer's Solution.—I have found it convenient to make Ringer's solution in concentrated form as a stock solution, which is later diluted before using. The following salts in the amounts indicated are dissolved in freshly distilled water and made up to 5 liters and filtered through a glass disk filter: sodium chloride, 750 Gm.; potassium chloride, 50 Gm.; calcium chloride, 25 Gm.; magnesium chloride, 25 Gm.

Magnesium has been added to the original Ringer's solution. Before using, this stock solution is diluted twenty-five times (20 cc. to 500 cc.) with freshly distilled water and sterilized in pyrex Florence flasks of 500 cc. capacity by autoclaving at from 15 to 20 pounds for thirty minutes.

Sodium Lactate.—This solution, also, can be made most conveniently in a concentrated form: i. e., as a molar solution, which may later be diluted as desired. Molar sodium lactate may be prepared by neutralizing 100 cc. of lactic acid (U. S. P.) with concentrated carbonate-free sodium hydroxide (approximately 40 per cent), phenol red being used as an indicator. The solution is made up to about 800 cc. with distilled water and heated to the boiling point for from thirty to forty minutes, small amounts of alkali being added meanwhile as needed to neutralize the lactic acid formed through hydrolysis of the anhydride. The solution is then made up to 1,000 cc. with freshly distilled water, filtered through a glass disk, sterilized in an autoclave at 15 to 20 pounds pressure for thirty minutes, and preserved in stoppered flasks or in sealed ampules.[3]

Lactate-Ringer's Solution.—If both the hypotonic Ringer's solution and the molar sodium lactate solution are available, lactate-Ringer's solution may be freshly prepared before using by simply adding 10 cc. of the molar sodium lactate solution to from 400 to 450 cc. of the Ringer's solution. If desired, the lactate-Ringer's solution may also be made in a concentrated form.[4]

Dextrose Solution.—For intravenous and subcutaneous injection, dextrose solution may be prepared quite easily. A convenient method is to prepare a 50 per cent stock solution as follows: Dissolve 1,000 Gm. of chemically pure dextrose (Mallinckrodt) in about 1,950 cc. of hot freshly distilled water; cool; make to 2,000 cc. in a volumetric flask and filter, preferably through a glass disk to avoid the inclusion of filter paper threads. From this concentrated stock solution, isotonic dextrose solution (5.5 per cent) may readily be prepared by diluting 55 cc. to 500 with freshly distilled water; a 10 per cent solution is made by diluting 100 cc. to 500 and a 20 per cent solution by diluting 200 cc. to 500. After the dilutions are made, they may be refiltered if necessary and sterilized by autoclaving at 15 pounds for thirty minutes. It is convenient to sterilize these solutions in pyrex Florence flasks of 500 cc. capacity, which may be used later for injection when fitted with the proper two-hole rubber stopper and tubing.

It is true that, on standing, such solutions become slightly acid in reaction. The total amount of acidity so developed, however, is so small that it is negligible, and, in my experience, does not lead to reactions when injected subcutaneously or intravenously. Only from 5 to 10 per cent dextrose solution should be injected subcutaneously, as the more concentrated solutions are irritating. Such sterile solutions may be kept in the refrigerator for several weeks, and perhaps even longer,

2. Hartmann, A. F., and Senn, M. J. E.: Studies in the Metabolism of Sodium *r*-Lactate: I. Response of Normal Human Subjects to the Intravenous Injection of Sodium *r*-Lactate; II. Response of Human Subjects with Acidosis to the Intravenous Injection of Sodium *r*-Lactate, J. Clin. Investigation **11**: 327 (March) 1932.

3. Such a molar solution may be obtained already prepared in 40 cc. ampules from Eli Lilly & Company, Indianapolis.

4. Such a concentrated solution may be obtained in ampule form from Eli Lilly & Co., Indianapolis, under the name of physiological buffer salts solution.

without causing reactions. It has been my policy, however, to make fresh solutions every week. Commercial products in ampule form may also be used if dilutions are made with freshly distilled sterile water before injection. My experience has been entirely satisfactory with such preparations.

For intraperitoneal injection, however, special precautions must be taken. Perhaps the best method is that described by Schwentker,[5] in which chemically pure dextrose is sealed in glass ampules and sterilized by boiling in a water bath for thirty minutes on each of three consecutive days. Just before using, the dry dextrose is dissolved in freshly distilled water to make an isotonic 6 per cent solution. In my own experience, however, distention has so frequently followed the intraperitoneal administration of dextrose that it is no longer given by this route. The explanation for such an undesirable reaction is suggested by the recent work of Darrow and Yannet,[6] who found that, when dextrose is injected intraperitoneally, electrolytes and water are first withdrawn from the blood until the fluid within the peritoneal cavity resembles the blood and intercellular fluid in its electrolyte composition.

Sodium Bicarbonate Solution.—This should be made up freshly before using. For intravenous injection, it is satisfactory to transfer chemically pure anhydrous sodium bicarbonate onto a clean filter paper taken from the middle of a pack with a flamed spatula. In this way the proper amount of sodium bicarbonate may be weighed to make a 5 per cent solution, the weighed material being added to cool, freshly distilled sterile water. While not absolutely sterile, this material is suitable for intravenous administration and has been used quite extensively without indications of infection. For subcutaneous injection, a 1.5 per cent solution is made, and a small amount of phenol red indicator is added. The solution is then filtered through a Berkefeld candle and, just before using, carbon dioxide is filtered through water and bubbled through the solution until the red color changes to orange. Such a solution is isotonic, sterile and of a p_H that is not irritating. Theoretically, such a solution should also be satisfactory for intraperitoneal injection, but I have never used it in this way and therefore cannot recommend its use. Another method of preparing sodium bicarbonate is that suggested by Cunningham and Darrow.[7] By this method previously sterilized sodium carbonate is partially neutralized by hydrochloric acid with the formation of sodium bicarbonate and sodium chloride.

Artificial "Spinal Fluid."—This solution was developed particularly to meet the needs of Dr. Ernest Sachs in replacement of lost ventricular fluid during certain intracranial operations, particularly choroidoplexectomy for the relief of hydrocephalus. At the time of injection into the ventricles, this solution closely resembles normal cerebrospinal fluid as far as content of sodium, potassium, calcium, magnesium, chloride, bicarbonate and p_H is concerned. Because of its bicarbonate content, the solution has to be prepared in two parts, which, after sterilization by autoclaving and proper dilution, are mixed in equal amounts just before using.

Solution 1 (concentrated): Preparation is as follows: sodium chloride, 300 Gm.; potassium chloride, 19 Gm.; calcium chloride, 10 Gm., and magnesium chloride, 20 Gm. are added to 1 liter (1,000 cc.) of freshly distilled water. Filter (preferably through a glass disk filter to exclude filter paper fibers). Autoclave at 15 pounds for thirty minutes. This is the concentrated solution 1 which should keep in pyrex glass indefinitely.

To prepare for mixing with solution 2, measure accurately 10 cc. (with a sterile pipet, so as not to contaminate the stock solution) and make to 250 cc. with freshly distilled water. It is convenient to do this in a 250 cc. volumetric flask. Make up to the mark, and then withdraw 10 cc. with the same pipet, leaving 240 cc. Place this amount in a pyrex glass flask or bottle of 500 cc. capacity, mix, and resterilize by autoclaving at 15 pounds for thirty minutes. Stopper with sterile (autoclaved) cork or rubber stopper. It is usually convenient to prepare about six such bottles of 240 cc. each of solution. This solution may be resterilized at any time, if thought advisable.

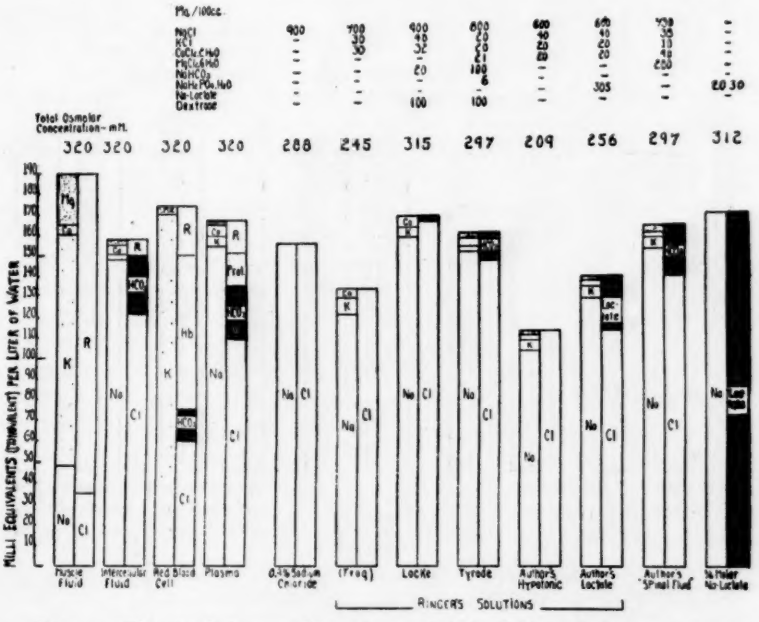

Chart 2.—The chemical composition of normal body fluids and the more common therapeutic solutions for parenteral injection.

Solution 2: Weigh out 5 Gm. of anhydrous sodium bicarbonate. Add a few milligrams of dry phenol red (phenolsulphonphthalein) and make to 1 liter (1,000 cc.) with freshly distilled water. Filter free of any suspended particles. Measure 240 cc. of this solution into a pyrex glass flask or bottle of 500 cc. capacity and sterilize by autoclaving at 15 pounds for thirty minutes. Stopper with a sterilized (autoclaved) cork. In this condition the solution may be resterilized at any time, if thought advisable.

Just before using, add exactly 1 cc. (measured with an accurate sterile pipet) of concentrated hydrochloric acid (36 per cent) to 240 cc. of solution 2, and mix by rotating the flask or bottle. The sodium carbonate should now be converted into sodium bicarbonate plus sodium chloride, and the color should change from red

5. Schwentker, F. F.: The Preparation of Dextrose for Parenteral Injection, Am. J. Dis. Child. **40**: 533 (Sept.) 1930.
6. Darrow, D. C., and Yannet, Herman: Effect of Changes in Extracellular Electrolyte on Cellular Electrolyte and Water, read before the American Pediatric Society at Asheville, N. C., in May 1934.
7. Cunningham, R. D. M., and Darrow, D. C.: Preparation of a Solution of Sodium Bicarbonate and Sodium Chloride for Hypodermoclysis, Am. J. Dis. Child. **41**: 1347 (June) 1931.

to an orange shade. If such a change does not occur, a drop more of the acid should be added. At this stage the solution can no longer be resterilized. Pour equal parts of solution 2 (after the addition of the hydrochloric acid) into solution 1 and mix by rotating the flask. This final mixture has now the composition of normal spinal fluid and is now ready for injection into the ventricles.

Acacia Solution.—While it is possible to prepare acacia solution satisfactorily for intravenous injection, it has proved much more convenient to use products already prepared, such as the product marketed by Eli Lilly & Co. This product is marketed in 30 per cent concentration and contains 4.5 per cent sodium chloride. Its most frequent use is its intravenous injection in cases of shock. For this purpose the original material is diluted five times with sterile distilled water or 20 per cent dextrose solution, so that the final concentration of acacia is 6 per cent and sodium chloride 0.9 per cent. When it is used for the relief of nephrotic edema, such dilution is unnecessary and the material may be used as marketed or diluted just sufficiently to enable it to flow readily by gravity.[8]

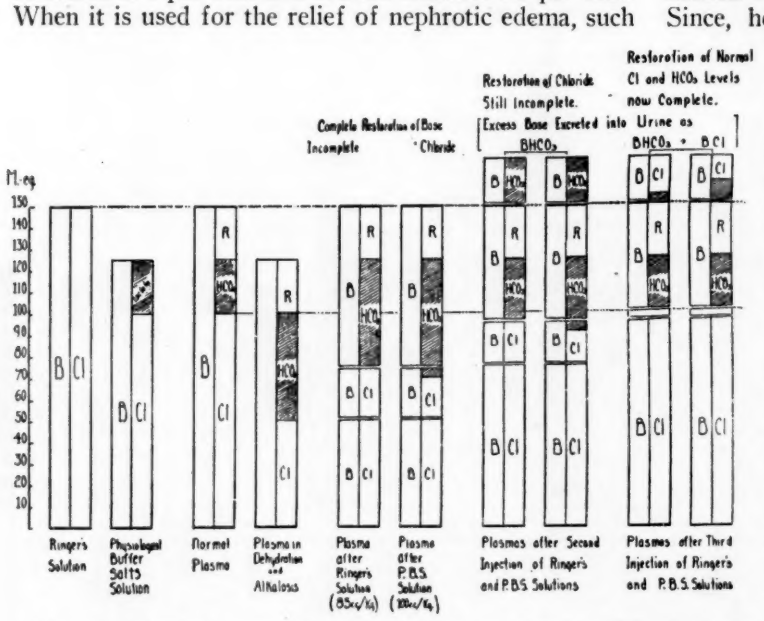

Chart 3.—Schematic recovery from severe alkalosis in response to Ringer's solution and to lactate-Ringer's solution.

SPECIFIC INDICATIONS

Ringer's Solution.—This solution is indicated whenever chlorides and the fixed bases sodium, potassium, calcium and magnesium have been lost. Therefore it is indicated in all forms of dehydration, but particularly in cases in which large amounts of gastro-intestinal secretions have been lost by vomiting, diarrhea or fistula, as occurs in such conditions as pyloric and intestinal obstruction, diarrhea, diabetic acidosis, glomerular nephritis (terminal stage) and many severe infections. Beneficial effects in acidosis or alkalosis result indirectly from improvement of the circulation and stimulation of renal activity. While Ringer's solution may be administered by any of the parenteral routes, it finds its chief use when administered subcutaneously or intraperitoneally. Ordinarily therapeutic doses, adequate for restitution of lost water and minerals, average from 80 to 100 cc. per kilogram of body weight.

Sodium Lactate Solution.—This solution is indicated in specific amounts in all types of severe acidosis other than that associated with congenital heart disease with persistent cyanosis. It is of value also for rapid alkalinization of the urine in the treatment of acute infections of the urinary tract. Sodium lactate may be administered by any of the parenteral routes. It is important that an isotonic solution be used for subcutaneous or intraperitoneal administration. One-sixth molar sodium lactate is isotonic and is made by adding one part of the molar sodium lactate solution to five parts of sterile distilled water. Somewhat more concentrated solutions may be given intravenously, but, especially during the presence of dehydration, it is unwise to use a solution more concentrated than the isotonic solution. If the carbon dioxide content of the blood is known, the amount of sodium lactate that will be required to raise the carbon dioxide content to the normal value of 60 volumes per cent may be calculated.[8] Since, however, the chief indication for the use of sodium lactate is the presence of a carbon dioxide content under 25 volumes per cent, a routine dose of 10 cc. of the molar solution per kilogram of body weight, diluted with five volumes of distilled water, will be generally satisfactory; i. e., this amount will tend to increase the carbon dioxide content by 25 to 35 volumes per cent. When merely alkalinization of the urine is desired, smaller amounts, i. e., 5 cc. molar solution per kilogram of body weight, are effective.

Lactate-Ringer's Solution.—Since its effect in the body is to relieve either acidosis or alkalosis of the metabolic types, lactate-Ringer's solution is indicated in all types of dehydration, especially when a chemical study of the blood has not been made. When severe alkalosis of the metabolic type is known to exist, the addition of lactate to the Ringer's solution is without benefit, aside from its antiketogenic and glycogenic effects. The addition of lactate to Ringer's solution, however, need not be feared, even if very severe alkalosis is present. The results obtained in such cases by (1) Ringer's solution, and (2) lactate-Ringer's solution are illustrated in chart 3. When very severe acidosis is known to be present, the amount of lactate indicated is of such an amount that it is much better to give the lactate independently of the Ringer's solution (i. e., as sixth molar sodium lactate), and later, if further fluid administration is necessary, it may be combined with Ringer's solution to prevent recurrence of acidosis.

Lactate-Ringer's solution may be given by any of the parenteral routes. It has almost entirely replaced the use of physiologic solution of sodium chloride or Ringer's solutions in the St. Louis Children's Hospital for the routine treatment of dehydration with or without the knowledge of coexisting chemical changes. When administered by the subcutaneous or intraperitoneal routes or as a single intravenous injection, therapeutic doses should average from 80 to 100 cc. per kilogram of body weight. Mixed with 10 per cent dextrose solution, it has been the fluid of choice for the continuous intravenous drip method of providing fluid.

Sodium Bicarbonate Solution.—The indications for the use of sodium bicarbonate solution are the same as

8. Hartmann, A. F.; Senn, M. J. E.; Nelson, M. V., and Perley, A. M.: The Use of Acacia in the Treatment of Edema, J. A. M. A. **100**: 251 (Jan. 28) 1933.

for sodium lactate solution. It is superior to the latter only in those conditions in which lactate metabolism may be seriously impaired (congenital heart disease with anoxemia being the only one that has been encountered so far in my experience), but it has many disadvantages.[2] A somewhat hypertonic solution may be given intravenously in a case of severe acidosis in a dosage of 0.5 Gm. of sodium bicarbonate per kilogram of body weight. A sterilized isotonic solution containing carbon dioxide in the proper amount may be given subcutaneously in corresponding amounts.

Dextrose Solutions.—Dextrose solutions are indicated when the carbohydrate metabolism is low, when ketosis exists, when hypoglycemia is present, and when there is depletion of liver or muscle glycogen: i. e., in such conditions as starvation, acute severe infections, intoxications, particularly in cases in which the liver and heart muscle are affected, and in hyperinsulinism. It is also of value in promoting diuresis and for this purpose may be used in acute nephritis with acute cerebral edema. Isotonic dextrose solution may be given subcutaneously or intravenously or, as previously mentioned, it may be mixed with equal parts of lactate-Ringer's solution to be given by either of those two routes. More concentrated solutions, even up to 50 per cent, may be given intravenously, when in particular edema is to be treated and when diuresis is particularly to be established. There is some danger of venous thrombosis when 50 per cent dextrose is used, particularly if the circulation is sluggish. Since dextrose solutions are given both for their dextrose and for their water content and for the relief of edema, no exact dosage can be given. In general, when given for purposes of administering fluid, from 80 to 100 cc. per kilogram may be given subcutaneously, and, roughly, from one-fourth to one-half that amount may be given as a single intravenous injection. When given in conjunction with lactate-Ringer's solution by the continuous drip method, the rate of flow should be from 3 to 6 cc. per kilogram hourly after dehydration has been relieved.

Artificial "Spinal Fluid."—The use of this solution has been as yet confined to cases in which operation is performed for hydrocephalus in which it is desirable to refill collapsed ventricles. Theoretically, at least, this solution should be much superior to physiologic solution of sodium chloride whenever replacement of, or admixture with, cerebrospinal fluid is to be considered, in such instances as "through and through" drainage for meningitis, spinal anesthesia and nerve block.

Acacia Solution.—Acacia is especially indicated when the blood volume has been reduced as the result of hemorrhage or shock. In such conditions the injection of electrolytes or nonelectrolyte crystalloids, such as dextrose, does not have much of an effect in increasing the blood volume, since they are free to pass through the capillary walls and actually diffuse quite rapidly into the tissue fluids. The plasma proteins and acacia, however, are normally impermeable, remain in the circulation and through their effect in raising the colloidal osmotic or oncotic pressure tend to maintain blood volume. In nephrotic edema the oncotic pressure of the plasma is reduced because of loss of protein from the blood, chiefly as the result of albuminuria. The glomerular membrane in such conditions is less permeable to acacia than to the plasma proteins, and through its use in such conditions the oncotic pressure of the plasma usually can be restored to a level sufficiently high to lead to loss of edema fluid. Acacia should be administered only intravenously, the concentration varying from 6 to 30 per cent. The solution injected should have roughly a sodium chloride concentration of from 0.6 to 0.9 per cent. Since the effect on edema of injected acacia depends largely on the concentration of acacia which is maintained in the blood plasma, which in turn is dependent on the amount given in relation to the original blood volume, the rate of excretion into the urine and the rate at which it is taken up by other tissues, the dose of acacia cannot be fixed.[8] In general, however, from 1 to 2 Gm. of acacia per kilogram of ideal body weight is given intravenously over a period of forty-five to sixty minutes and may be repeated daily until as much as 10 Gm. per kilogram has been given.

Blood.—Specific indications for the administration of whole blood are: (1) reduction in blood volume, resulting from hemorrhage or prolonged malnutrition; (2) severe anemia, particularly if the erythrocyte count is low; (3) blood dyscrasias associated with a bleeding tendency, such as hemorrhagic disease of the new-born and hemophilia; (4) edema which is due chiefly to diminished plasma protein ("nutritional" edema, nephrosis and chronic active glomerular nephritis), and (5) possibly icterus gravis of the new-born and other types of hemolytic anemias. In such instances there is either a qualitative or a quantitative deficiency of whole blood or some of its components, such as erythrocytes, platelets or plasma. As a rule, sufficient whole blood may be given to correct such a deficiency. The most important exception is the edema of nephrosis, in which the protein loss through the kidney may equal or excel the rate at which protein can be injected as whole blood. In such instances, larger amounts of protein may be administered as plasma transfusions or, as is not infrequent, a substitute for protein in the form of acacia must be relied on. In a number of instances of rheumatic heart disease with failure, severe anemia was relieved by transfusing cells suspended in citrated saline solution without running the risk of increasing the cardiac embarrassment by increasing the blood volume or viscosity by adding more plasma protein.

Blood transfusions have also been extensively used in both acute and chronic infections, with the hope of administering antibodies. Probably because of the frequent lack of such antibodies in high concentration, results in such cases have often been disappointing.

In general the intravenous route is the one of choice, particularly if the function of the erythrocytes is to be preserved. The usual amount of blood given in this way is about 20 cc. per kilogram of body weight. More may be given safely in cases of hemorrhage, while in the presence of cardiac or pulmonary lesions it is often desirable to repeat much smaller transfusions (5 cc. per kilogram). In states of severe nephrotic edema, very much larger amounts of plasma may be given, because of the rapid loss of plasma protein by way of the urine. When given subcutaneously or intramuscularly, the erythrocytes are destroyed but the plasma elements rapidly make their way into the blood stream. Under favorable conditions apparently most of the blood given intraperitoneally finds its way rapidly into the circulation. My experience with very sick infants, however, has been discouraging, in that abdominal distention tends to result, and in several instances, most, if not all, of the blood injected was found unabsorbed after death several days later.

Combinations of Various Solutions.—Injection of sodium lactate and Ringer's solution has already been considered. In a similar fashion, dextrose may be combined with Ringer's or lactate-Ringer's solution. As a rule, it is best to mix isotonic solutions in equal volumes, so as to preserve isotonicity. Equal parts of 10 per cent dextrose solution, however, may be added to Ringer's or lactate-Ringer's solution and given intravenously without any deleterious effect. Dextrose and sodium bicarbonate may be mixed, if the resultant mixture is given immediately. On standing, however, dextrose decomposes much more rapidly in the presence of alkali. Sodium bicarbonate cannot be mixed with Ringer's solution without precipitation of calcium bicarbonate. Since acacia solution contains considerable amounts of calcium, bicarbonate solution and acacia are also incompatible for this reason. Acacia cannot be mixed with citrated whole blood either, since the calcium content of the acacia will neutralize the effect of the citrate and permit clotting to occur.

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ABSTRACT OF DISCUSSION

DR. ARTHUR G. HELMICK, Columbus, Ohio: Sometime ago I had the opportunity of viewing the immediate effects of fluid introduced into the abdominal cavity. It was entirely new to me and I thought it of sufficient interest to bear repetition. It came about by accident in connection with an operation for pyloric stenosis. In these cases, it is my custom to give 5 per cent dextrose in physiologic solution of sodium chloride subcutaneously. In this particular instance there was a new house officer on duty. The method of administering the fluid not being specified, he gave it intraperitoneally. The next morning some fifteen hours afterward, when the surgeon opened the abdominal cavity, quite a little of the solution was still present as well as a brownish gelatinous substance, which covered the abdominal parietes as well as the intestine. This material did not seem to be a mass but it was evenly distributed over the surface as if it might have been painted on. It was of such a character that it made any type of manipulation almost impossible, and it was only with great difficulty that the operation was completed. The youngster made an uninterrupted recovery from the immediate effects, but a short while afterward there was a recurrence of the original symptoms and an exploration was decided on. This was done. About the seat of the original operation was a dense mass of adhesions. These were broken up, there was great shock, and the child died some hours later. I think two distinct facts can be drawn from this instance: First, one dare not be too dogmatic concerning the rapidity and thoroughness with which the abdomen absorbs fluid, and, second, it is evident that abdominal operations will have to be added to the contraindications already known, to the administration of certain, if not all, fluids intraperitoneally.

DR. JOSEPH C. RAY, Louisville, Ky.: My work in venoclysis has followed closely that of Dr. George A. Hendon of Louisville in adults. We have applied it also to very young persons. Venoclysis is administered by attaching a cannula into the vein for the continuous administration of fluid. The fluid which we have found most successful in administering to children has been a 5 per cent solution of dextrose given at the rate of about 2 cc. an hour for each kilogram of body weight, though it may be given at a much more rapid rate. The calcium is given with the dextrose, about 15 grains (1 Gm.) per thousand cubic centimeters of dextrose. Venoclysis is not administered in cases of marked edema or marked kidney destruction but is given in almost all cases of dehydration from any toxic condition, vomiting, or the like. It supplies fluid and nourishment when the intestinal tract fails to absorb. The stomach content at different times has been analyzed during this administration. It may be acid or it may be alkaline, but neither of these conditions has played a great part in the treatment.

DR. ALEXIS F. HARTMANN, St. Louis: I don't believe Dr. Helmick really wanted to give the impression that one should never give fluids intraperitoneally but rather that one should be careful about the time and the type of fluids to be given. His experience with peritoneal irritation and slow absorption has been the experience of others, particularly when dextrose solution has been used. Such a reaction has been so general that a number of workers have attempted to improve the dextrose solution to avoid this effect. Grulee and Schwentker have recommended the administration of dry sterilized dextrose but, as Darrow has shown, the effect of pure dextrose administration intraperitoneally is to take out salts and water from circulating blood and to make a solution within the peritoneal cavity that is chemically similar to the blood. I have had that impression for some time and therefore have attempted to make the injected fluid essentially similar to normal body fluids and blood plasma. I am also very careful about not injecting intraperitoneally fluid within twelve hours of a contemplated operation or when there seems a possibility of some abdominal complication. I also have found the continuous intravenous method of extreme value. I think better than just the 5 per cent dextrose solution, which, after all, affords only water and some food, which is also glycogenic in its action, is the mixture of equal parts of 10 per cent dextrose solution and lactate Ringer's solution, which also supplies the chemicals that may be necessary to help restore chemical changes.

SOME PHYSIOLOGIC CHANGES DURING HYPERPYREXIA INDUCED BY PHYSICAL MEANS

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Forty-six years ago Dr. William H. Welch wrote: "Enlightened physicians have held the opinion that fever is a process which aids in the elimination or destruction of injurious substances which gain access to the body. The doctrine of evolution indicates that a process which characterizes the reaction of all warm blooded animals against the invasion of harmful substances has not been developed to so wide an extent and is not retained with such pertinacity without subserving some useful purpose."[1] Recent advances in the application of fever as a therapeutic agent have tended to substantiate the correctness of these ideas.

The treatment of a large series of cases by substantial elevation of body temperature within a short period of time offered us a unique opportunity for the study of the physiologic changes in the body induced in response to high temperatures. These observations are of practical value, as they permit us to rationalize this therapy on the basis of the physiologic changes which it produces and also because they may throw some light on the purposefulness of fever when it occurs in response to some insult to the body. Our observations were made on individuals suffering from a great variety of diseases. They were exposed to short-wave radiation of about 30 meters wavelength. This caused their systemic temperatures to become elevated to about 104 to 107 F. within a period varying from one to one and a half hours. This temperature elevation was then maintained for periods varying from three to six hours by trans-

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Read before the Section on Pathology and Physiology at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 15, 1934.

1. Welch, W. H.: The Cartwright Lectures on the General Pathology of Fever, M. News **52**: 365, 393, 539, 565, 1888.

ferring the patient to a bed covered with a hood containing carbon filament lamps.

In this presentation it is not our purpose to discuss in detail the changes occurring during hyperpyrexia but rather to make note of some of the summarized facts that we have observed. A more critical analysis of these changes is available in the papers that have been and are soon to be published by other workers and by ourselves.

When heat producing physical energy is applied to the body in a quantity sufficient to overcome its thermoregulatory mechanism as evidenced by a rise in the temperature of the rectum, the body makes an added effort to increase its dissipation of heat. Sweating occurs. The skin surface temperature rises promptly. The skin surface temperature gradient that ordinarily exists (the temperature of the skin covering the fingers, the lower extremities and particularly that of the toes being several degrees lower than that of the torso) is eliminated, so that the various portions of the skin surface of the body reach a more or less common temperature level. This level is lower than the temperature occurring in the interior of the body even when the temperature of the surrounding air is much higher. In the fever produced endogenously, as in response to the injection of typhoid vaccine intravenously, the temperature of the skin surface of the extremities does not rise until after the systemic temperature has become markedly elevated. Subsequently the skin surface temperature rises and its gradient disappears. Bazett noted that "while on exposure to heat there is therefore evidence of diminished peripheral resistance in the skin area, in fever, particularly during the stage when the temperature is rising, the skin appears pale, the veins are constricted and vasoconstriction in this area is indicated by a temporary failure to increase heat loss in spite of the rise in body temperature." [2]

Because we seriously interfered with the thermoregulation of the body and produced temperatures that with further slight additions might prove dangerous, we realized the necessity for making constant observations of the systemic temperature. We found that a knowledge of the rectal temperature as indicated by an automatic registering thermometer was a sufficiently accurate guide for this purpose. When, however, we employed a technic for the differentially increased heating of the pelvic tissues (as in the treatment of gonorrhea) [3] we could no longer rely on the rectal temperature as an index of body temperature. We then followed the temperature in the mouth even though we frequently noted that the temperature of this area did not bear an exact relationship to that in the rectum. As a rule it averaged about 0.7 degree F. lower than the rectal temperature. Occasionally it was higher, or the same, or more than 2 degrees F. lower.

The velocity of the blood flow becomes markedly accelerated. On one occasion we have observed an increase of more than 400 per cent.[4] This acceleration may be accounted for by the changes in the pulse rate, in the blood pressure, and in the volume and viscosity of the blood.

The pulse rate increases. In 500 observations we found that the rate of increase averaged 8.5 beats per minute for each degree Fahrenheit of temperature elevation. Bazett noted that the pulse rate varies in experimental pyrexia according to the body temperature in a manner similar to that of fever, with an increase of from eight to ten beats a minute for each degree above 98.6 F.[2]

Employing the common auscultatory technic, we noted that the systolic blood pressure usually shows a slight elevation followed by a gradual fall to a point below the original level. The sound associated with the diastolic pressure becomes audible at increasingly lower levels until it is heard (though frequently changed in character) when the mercury in the manometer reaches the zero level. After a period of an hour or two the diastolic sound becomes heard at higher levels, until it reaches a point slightly above the original one.

Although these patients lose large quantities of fluid through the sweat (as much as 3 or 4 liters) their weight at the end of the treatment is about the same as that at the beginning, if they are permitted to drink as much fluid as they desire. The blood volume commonly remains about the same and so does the blood viscosity.

The respiratory rate increases. Shortly there appear apneic periods, which gradually increase in their frequency and in their time duration so that occasionally no respiratory effort is visible during a period as long as one minute. Between these apneic periods there are intervals of increased rate and depth of respiration. With a reduction of systemic temperature the apneic periods become less frequent and shorter, and gradually the original type of respiratory excursions become reestablished. These changes in the character of the respiratory movements are reflected in the altered status of the oxygen and carbon dioxide content of the blood and in its increased p_H.

The number of the white blood cells in the blood changes. The leukocytes show an initial reduction in number of about 25 to 30 per cent occurring during the first and second hour following the inauguration of hyperpyrexia. This is constantly followed by a leukocytosis the maximum of which, amounting to about 80 per cent above the initial figure, occurs from about the sixth to the ninth hour. These variations are due mainly to changes in the total number of the neutrophils, of which the staff neutrophils show the greatest increase. These changes together with the appearance of immature forms (myelocytes, metamyelocytes, premyelocytes and myeloblasts) indicate a stimulation of the bone marrow. At a later stage the monocytes increase in number and also the lymphocytes. Repeated stimulation by heat is followed by a reduction in the leukocyte response.[5]

Observations of the rate of sedimentation of the erythrocytes when this is high show a fall in the rate as a result of temperature elevation.

The reaction, the osmotic pressure and the volume relationships of the body fluid are closely dependent on properly regulated acid-base equilibrium. Hence the study of the regulatory mechanisms for the preservation of acid-base equilibrium during heavy sweating furnishes insight into the underlying mechanisms that regulate many normal physiologic processes. The

2. Bazett, H. H.: Circulation in Pyrexia, J. A. M. A. **97:** 1271 (Oct. 31) 1931.

3. Bierman, William, and Schwartzchild, Myron: General Hyperthermia with Heat Localization by Radiothermy, Proc. Soc. Exper. Biol. & Med. **29:** 439 (Jan.) 1932.

4. Kissin, Milton, and Bierman, William: Influence of Hyperpyrexia on Velocity of Blood Flow, Proc. Soc. Exper. Biol. & Med. **30:** 527 (Jan.) 1933.

5. Bierman, William: Effect of Hyperpyrexia Induced by Radiation upon the Leukocyte Count, Am. J. M. Sc. **187:** 545 (April) 1934.

changes to be recorded take place within a comparatively short time, so that one can study the factors regulating the acid-base balance without the interfering effects of the intake of food and the loss of catabolites in the feces. More important, one is enabled to watch the compensatory mechanisms whereby the loss of fixed base is reduced to a minimum at a time when the body fluids are undergoing marked changes. Since the patients treated in this investigation suffered from such varied pathologic conditions as dementia paralytica, tabes, acute gonorrhea, arthritis, scleroderma and psoriasis, we feel justified in interpreting the results that remain consistent throughout the investigation as fairly independent of the specific pathologic condition of the patient.

The regulating factor in the mechanism of adjustment to high temperature is naturally the very heavy excretion of sweat, the excretion of urine being below normal during this period. There is an enormous loss of body fluid through sweat, which in fact almost equals the entire blood volume. It is known that miners during work can lose as much as 3,000 cc. of body fluid an hour, and Dr. Dill informs us that during his investigations in the desert of Arizona his subjects lost as much as 5 liters an hour.[6] During exertion and at high temperatures the lack of balance between the fixed base and the acid catabolites is augmented, and some regulatory mechanism is essential if the fixed base depots of the body are not to be drained. The base economy factor of the skin will depend on its ability to produce a fluid of lower p_H than the plasma, which acts as the carrier of catabolic products. There has been a long controversy as to the reaction of the sweat, which has only lately been settled by the introduction of the electrometric method of p_H determination. As early as 1833 Thénard reported that the sweat is definitely acid.[7] It is known that athletes complain of stinging sweat. Marchionini[8] showed that the divergence of the results obtained previously was due principally to the admixture of apocrene sweat, which is distinctly alkaline. This apocrene sweat is secreted by special glands in the axilla and the genitoperineal region and is very rich in odoriferous substances and cell content. During heavy sweating the proportion of this type of sweat becomes very small and results are obtained which more accurately measure the true p_H of the exocrene sweat secreted all over the body as a result of exertion and high temperature. In our cases the p_H of the sweat was determined by the hydrogen electrode method and varied between 4 and 5.

At a range of p_H as low as this, several important changes come into play. The acid substances are carried for excretion bound in the plasma and consist of carbonates, phosphates, sulphates, chlorides, the salts of organic acids and proteinates. All of these appear in the sweat except the carbonates and proteinates. The skin is impermeable to proteinates, while at a low p_H carbonates as such are practically nonexistent. Thus a wasteful expenditure of base for a catabolite that can be excreted practically base free through the lungs is avoided. This is analogous to the mechanism operating in acid urines. Thus the carbonates and proteins do not enter the sweat but remain in the plasma and exert their function in stabilizing the reaction of the blood.

The presence in the sweat of an acid that would be ionized to only a relatively low degree would allow of the excretion of a large amount of acid catabolite without undue strain on the fixed base of the body. Such an acid we found in lactic acid, which at the p_H of sweat is about 50 per cent ionized. It is peculiar that the presence of lactic acid in the sweat is scarcely mentioned in the literature. Liebermann in 1880 stated that, in patients suffering from puerperal fever, lactic acid is found in the sweat.[9] Snapper found quantities of lactic acid of over 1 Gm. in the shirts of football players after the Olympic games.[10] When it is considered that the shirts covered only a portion of the body it can be seen that the actual quantity of lactic acid must have been much higher.

In addition to its base-saving properties, lactic acid can act as a powerful buffer. It is present in the sweat in a concentration of from 250 to 350 mg. per hundred cubic centimeters. Since the chloride ion content of the plasma is about 0.35 per cent and the lactic acid 0.01 per cent it is evident that the chloride content of the plasma is about equal to that of the sweat, while the lactic acid is twenty times higher in the sweat than in the plasma. Hence the skin functions simply as an ultrafilter with regard to the chloride, while it can concentrate the lactic acid to higher amounts. It is significant that just those constituents which are excreted by the kidney at practically the same concentration as in the plasma are also excreted in the same ratio in the sweat; namely, chloride, sodium and calcium.

If a solution of weak lactic acid is titrated with its equivalent of sodium hydroxide at 37.5 C., it is found[11] that the p_H at the half titration point of the solution is 3.94 and the dissociation constant is 1.23×10^{-4}. Hence at the p_H of sweat, lactic acid is half dissociated. It can be excreted in an un-ionized form resulting in the sparing of 15 units of tenth normal base per hundred cubic centimeters. The absolute sparing of base is large, in view of the fact that when one is dealing with approximately 3,000 cc. of fluid, the proportion of equal parts of lactic acid and its alkali salt is the condition at which the buffer mechanism is at a maximum. This lactic acid buffer system in the sweat is analogous to the protein buffer system in the blood and the phosphate buffer system in the urine. The buffer value of the sweat is approximately that of a two hundredth-normal solution of a buffer acid whose dissociation constant equals 10^{-4}. The actual stimulus to the secretion of sweat is in dispute. It seems possible that the lactic acid formed at high temperatures and during exertion may be the actual substance initiating the process and that the lowered p_H is necessary for the proper functioning of the gland. Some mention should be made at this point of the phylogenic homology between the mammary glands and the sweat glands.

The formation of lactic acid in the blood results in a lowering of the carbon dioxide content to levels of 30 or 25 volumes per cent, in contrast to the normal 50 or 60 volumes per cent. The stimulatory effect of the free carbon dioxide on the respiratory center soon results in a blowing off of more carbon dioxide and the patients are found to manifest extreme alkalosis,

6. Dill, D. B.: Personal communication to the authors.
7. Thénard, Louis-Jacques: Traité de chimie élémentaire, Paris, Crochard, 1833.
8. Marchionini, Alfred: Die Warserstoffionenkonzentration des Schweiss, Klin. Wchnschr. **8**: 924 (May 14) 1929.
9. Liebermann, Leo: Chemie des Menschen, Stuttgart, F. Enke, 1880.
10. Snapper, I. and Grünbaum, A.: Ueber die Milchsäure Ausschiedung im Harn und Schweiss während Fussballwettkämpfe, Biochem. Ztschr. **206**: 319 (March 9) 1929.
11. Fishberg, E. H., and Bierman, William: Acid-Base Balance in Sweat, J. Biol. Chem. **97**: 433 (Aug.) 1932.

the p_H of the blood reaching levels as high as or higher than any we have seen in a general hospital service. They approach 7.6, which is the highest value actually recorded in the literature. The low carbon dioxide tension results in a compensatory migration of the chloride from the cells into the serum in order to restore the normal values of the electrolyte distribution in accord with the Donnan equilibrium with consequent maintenance of normal osmolar relationships. The extreme loss of chloride resulting from heavy sweating naturally diminishes the chloride in whole blood, but the migration of the chloride from cells to serum results in changed distribution ratio.

The heavy sweating, by removing the chloride, results in a urine that is extremely poor in chlorides, the concentration in the urine not exceeding for the twelve hours after treatment one fourth of the content of the corresponding twelve hours before treatment.

The gastric juice shows a similar loss of chloride with a practically total cessation of secretion of free hydrochloric acid. The values of the p_H after a test meal scarcely deviates at the height of digestion from the values recorded before the meal. Certain English physiologists have shown that gastric acidity is proportional to the amount of free carbonic acid actually circulating in the blood.[12] Our results are in accord with these observations, since the increased breathing drives off carbon dioxide and the higher temperature greatly lessens its solubility, so that the lowered carbon dioxide results in a great lessening of the secretion of acid in the stomach.

The patient at a higher temperature shows a great increase in hemoglobin in response to the heightened oxygen demand. Our patients showed an increase in oxygen combining capacity from a normal of approximately 19 volumes per cent to 23 volumes per cent, which was in accord with the increased hemoglobin. In spite of this increase in the actual oxygen carrying factor of the blood, the percentage of saturation was actually lower. The difference in oxygen saturation between the venous and arterial blood was extremely small.

Because of its therapeutic significance, the effect of temperature elevation on the bacterial invaders of the human organism becomes of interest. It appears possible to exert a direct thermolethal effect on the bacteria like the gonococcus within the human body. We have on several occasions achieved a complete eradication of this organism within the female pelvis by creating a systemic hyperpyrexia plus higher local pelvic heating, to temperatures of about 110 F. which were maintained from three to four hours.[13]

Rabbits that have been immunized against staphylococci, streptococci and Micrococcus catarrhalis and diphtheroid bacilli showed a temporary diminution of the complement fixing antibody titer of their blood as a result of hyperpyrexia produced by physical means.[14] We have also observed a reduction in the complement fixing titer in the serum of individuals suffering from gonorrhea (with positive complement fixation in the blood serum) as a result of the administration of hyperpyrexia.

12. Apperly, F. L., and Crabtree, M. G.: Relation of Gastric Sensation to Chemical Composition of the Blood, J. Physiol. **73**: 331 (Dec.) 1931.

13. Bierman, William, and Horowitz, E. A.: General Hyperthermia with Heat Localization by Radiothermy in the Treatment of Pelvic Inflammatory Disease, New York State J. Med., Feb. 15, 1933.

14. Hadjopoulos, L. G., and Bierman, William: Effects of Hyperpyrexia Induced by Physical Means upon Complement Fixing Antibodies, unpublished.

SUMMARY

Observations have been made of some changes occurring in the body as a result of the elevation of its temperature by physical means. These observations included changes in the skin surface temperature, relationship between the mouth and rectal temperatures, velocity of blood flow, pulse rate, blood pressure, blood volume, blood viscosity, respiratory excursions, number of white blood cells, erythrocytic sedimentation rate, chemistry of the sweat, blood, urine, gastric contents, and the serologic reactions of the blood.

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THE TREATMENT OF CHRONIC RHEUMATOID ARTHRITIS WITH STREPTOCOCCUS VACCINE

ON THE BASIS OF SKIN SENSITIVITY

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The relation of streptococci and streptococcic infection to chronic rheumatoid arthritis remains in an uncertain and far from established position in spite of the many diligent investigations pursued during the past decade. Not only do students of the disease differ regarding the interpretation of experimental results but the results themselves lack uniformity. If a relationship exists, it might do so in one of three ways: 1. The joint lesions may be the result of the localization of streptococci circulating in the blood stream. 2. The joint lesions may be due to toxins liberated from some focus of streptococcic infection elsewhere in the body. 3. The joint reactions may be allergic in nature and represent hypersensitivity of the joint tissues to streptococci, resulting from low grade infections or from the persistence of foci of infection in the body.

If the first relation obtains, then the nature of the joint change and the method of its production are easily understood, for the condition is a metastatic infection. If the second, then a high degree of specificity is implied. If the third, then an equally high degree of specificity exists, or else one must assume with Clawson and Wetherby [1] that there is specificity for a species rather than for a strain. If the joint changes are regarded as allergic it is at times difficult to explain just how the contact of antigen with antibody comes about in the allergic joint.

The announcement by Cecil, Nicholls and Stainsby [2] in 1929 that they had isolated an atypical hemolytic streptococcus from the blood stream and joints of over two thirds of their patients with chronic rheumatoid arthritis immediately aroused great interest. Not only was the percentage of their positive cultures far larger than that obtained by previous investigators, but the report was particularly noteworthy since the organism isolated was hemolytic. The ability of their "typical strain" to hemolyze blood was at variance with the cultural characteristics of the organisms previously

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Read before the American Association for the Study and Control of Rheumatic Diseases, Cleveland, June 11, 1934.

1. Wetherby, Macnider, and Clawson, B. J.: Chronic Arthritis with Special Reference to Intravenous Therapy, Arch. Int. Med. **49**: 303 (Feb.) 1932.

2. Cecil, R. L.; Nicholls, E. E., and Stainsby, W. J.: Bacteriology of Blood and Joints in Chronic Infectious Arthritis: Arch. Int. Med. **43**: 571 (May) 1929.

isolated by Moon and Edwards,[3] Richards,[4] Hadjopoulos and Burbank[5] and others. These investigators had reported finding Streptococcus viridans in blood cultures, although in only a small number of cases. Cecil, Nicholls and Stainsby were able, by the intravenous injection into rabbits of their "typical" hemolytic streptococcus, to produce an arthritis analogous to rheumatoid arthritis in human beings, without associated visceral lesions, and to recover the organism from the blood stream and joints of their inoculated animals.

The results of Cecil and his co-workers have been confirmed by some investigators and denied by others.

TABLE 1.—*Results of Agglutination Tests with Strains of Hemolytic Streptococci*

	Total Number of Cases	Total Positive Agglutinations	AB_{13}		NY_5	
			Living Antigens	Heat Killed	Living Antigens	Heat Killed
Chronic rheumatoid arthritis.....	51	46	41	39	42	39

For instance, Klugh[6] was able to isolate a streptococcus in an even larger proportion of cases, namely 72 per cent, Gray and Gowen[7] in 58 per cent, and Wetherby and Clawson[1] in 50 per cent. In these reports the organism is classified as a Streptococcus viridans. On the other hand, Dawson, Olmstead and Boots[8] were able to recover a streptococcus from only 2.5 per cent of their cases, and Nye and Waxelbaum[9] obtained no streptococci in any of their cases of either acute or chronic infectious arthritis. Lichtman and Gross[10] grew streptococci from only 9 per cent of their series and considered this percentage no greater than that of the "transient streptococcemias found in the routine blood culture work of a general hospital."

Although the lack of uniformity in the results obtained from blood cultures is striking, the presence of serum agglutinins for hemolytic streptococci in a very large percentage of cases of rheumatoid arthritis has been reported by numerous observers. Dawson, Olmstead and Boots[11] found that 67 per cent of 157 cases possessed this property in their serums to a dilution varying from 1:20 to 1:2,560 or higher. Nicholls and Stainsby[12] found streptococcus agglutinins for their "typical strains" present in the serum of practically all patients with chronic infectious arthritis. Keefer, Myers and Oppel[13] found that 54.5 per cent of their patients with rheumatoid arthritis showed blood serum agglutinins for the four strains of hemolytic streptococci used.

In approaching the subject from another angle, it has been reported that patients suffering from rheumatoid arthritis show positive skin reactions to killed streptococci and their fractions in a larger percentage than do healthy persons or those suffering from some other disease. Birkhaug[14] found that 47 per cent of sixty-nine cases of chronic arthritis showed marked skin reactions to both nonhemolytic and hemolytic streptococci. Myers, Keefer and Oppel[15] obtained positive reactions to the nucleoprotein of a strain of Streptococcus scarlatinae in 70 per cent of their cases of rheumatoid arthritis, whereas 44 per cent of their control series gave positive reactions. In 32 per cent of the cases of rheumatoid arthritis the reaction was marked, whereas it was marked in but 12 per cent of the controls. Wetherby and Clawson[1] found that 91.8 per cent of their cases of chronic arthritis gave positive reactions when tested intradermally with Streptococcus viridans obtained from the blood of a patient with acute rheumatic fever. A positive reaction was obtained in only 49.6 per cent of their controls. They felt that the positive skin test probably indicated hypersensitiveness to the strain of streptococcus used and that the percentage of positive reactions was significantly higher in chronic arthritic patients than in a series of controls.

BLOOD CULTURES

The recovery of streptococci from the blood stream and joints of such a large percentage of cases of rheumatoid arthritis is a matter of great importance. If the observations are confirmed, the arthritis must be regarded as probably metastatic. At the Johns Hopkins Hospital I have been unable to duplicate the results of Cecil, Nicholls and Stainsby. Using essentially their technic ninety-four blood cultures in ninety-one cases of chronic rheumatoid arthritis of the following varieties were made: seventy cultures in sixty-seven cases of rheumatoid arthritis; eight cultures in eight cases of combined arthritis; fifteen cultures in fifteen cases of atypical rheumatoid arthritis, and one culture in one case of Still's disease.

TABLE 2.—*Highest Dilution of Serums in Which Agglutination Occurred* *

	Dilutions						
	1:20	1:40	1:80	1:160	1:320	1:640	1:1,280
AB_{13} A.....	1	2	10	11	8	5	4
AB_{13} HK.....	1	2	16	8	7	3	2
NY_5 A.....	1	2	11	10	8	7	3
NY_5 HK.....	2	7	10	6	5	7	2

* A denotes living antigens; HK, heat killed antigens.

Two departures, however, were made from the technic of Cecil, Nicholls and Stainsby: 1. The blood was collected and allowed to clot in the 500 cc. Erlenmeyer flask in which the culture was to be made. Coagulation was allowed to take place with the flask in a tilted position so that the clot became adherent to the side of the flask and later could easily be broken up. After standing over night the expressed serum was

3. Moon, V. C., and Edwards, S. R.: Blood Cultures in Rheumatoid Arthritis, J. Infect. Dis. **21**: 154, 1927.
4. Richards, J. H.: Bacteriologic Studies in Chronic Arthritis and Chorea, J. Bacteriol. **5**: 511 (Sept.) 1920.
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7. Gray, J. W., and Gowen, C. H.: Rôle of Streptococcus in Arthritis Deformans, Am. J. M. Sc. **182**: 682 (Nov.) 1931.
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9. Nye, R. N., and Waxelbaum, E. A.: Streptococci in Infectious (Atrophic) Arthritis and Rheumatic Fever, J. Exper. Med. **52**: 885 (Dec.) 1930.
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13. Keefer, C. S.; Myers, W. K., and Oppel, T. W.: Streptococcal Agglutinins in Patients with Rheumatoid (Atrophic) Arthritis and Acute Rheumatic Fever, J. Clin. Investigation **12**: 267 (March) 1933.
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15. Myers, W. K.; Keefer, C. S., and Oppel, T. W.: Skin Reactions to Nucleoprotein of Streptococcus Scarlatinae in Patients with Rheumatoid Arthritis and Rheumatic Fever, J. Clin. Investigation **12**: 279 (March) 1933.

drawn off with a pipet in one manipulation. The beef heart infusion broth used as the culture medium was then transferred to the flask in which the blood had been collected and had clotted. After the addition of the broth the clot was broken up into a number of pieces by strokes of a sterile pipet. 2. Subcultures were made at ten day intervals instead of five and during the month's incubation the flask was opened only three times. The same medium was used in making the joint cultures and they were subcultured also at ten day intervals. The results of our cultures were as follows: Streptococcus viridans was obtained from one case of rheumatoid arthritis; diphtheroids from three cases of rheumatoid arthritis and from one case of atypical rheumatoid arthritis; staphylococci were obtained from four cases and gram-positive bacilli were obtained from three cases.

In only one instance was a streptococcus obtained, and this proved to be Streptococcus viridans. However, we were unable to obtain this, or any other organism when the culture was repeated. The diphtheroids occupy the usual uncertain position with regard to their significance. The staphylococci and gram-positive bacilli were considered contaminations.

Fourteen joint cultures were made in fourteen cases of rheumatoid arthritis. Twelve of these were negative, and two were contaminated with mold.

AGGLUTININ REACTIONS

We then tested the serums of fifty-one patients with rheumatoid arthritis for the presence of agglutinins for hemolytic streptococci. These tests were made with both living and heat killed antigens. The tubes were placed in the water bath at 56 C. for two hours and then transferred to the icebox, where they remained during the night and were read the following morning. The serums were tested as a routine for the presence of agglutinins for AB_{13}, a "typical" strain obtained from Cecil, Nicholls and Stainsby and for the scarlet strain NY_5. The results are shown in the accompanying tables.

In our series, forty-six patients, or 90 per cent, were found to possess agglutinins in their serum in the dilution indicated in table 2. However, the extent of the dilution in which agglutination was obtained was somewhat lower than that reported by other observers. Six per cent did not show any reaction.

SKIN REACTIONS

In order to determine the strain of streptococcus to which our cases of rheumatoid arthritis showed the maximal skin reaction, we made intradermal tests in fifty-five cases. The tests were not done for the purpose of comparing either the frequency or the intensity of skin reactions in arthritic patients with those in nonarthritic patients; therefore we have no series of controls. Our object was to determine the strain and the type of streptococcus to which the patients of our series showed the maximal skin reaction, and to use this information as a guide to vaccine treatment. We confined the tests to streptococci, not because these organisms have been so frequently recovered from the blood and joints by others, although completely missed by us, but because of the serum agglutinins for hemolytic streptococci which have been found with such constancy in these patients by all observers.

The antigens used in the tests were prepared from strains of streptococci, both hemolytic and green, obtained from foci of infection in arthritic patients; a green strain isolated from a knee joint, later referred to as "Tschetter"; AB_{13}, the so-called typical strain obtained from Cecil, Nicholls and Stainsby, and stock laboratory strains. No tests were made with autogenous strains.

The organisms were grown in meat infusion broth for twenty-four hours. A portion of the culture was then centrifugated and the precipitated organisms were suspended in salt solution. The whole organism was used in preparing the suspension and appropriate dilutions were made, so that 0.1 cc. of the salt solution suspension contained approximately one million organisms. The suspensions were placed in the water bath at 56 C. for one hour, at the end of which time cultures were made and allowed to incubate for forty-eight hours. If the cultures remained sterile the suspensions were then ready for use. No preservative was added.

TABLE 3.—*Skin Reactions to Intradermal Injections of Streptococci in Fifty-Five Cases*

Number reacting to hemolytic streptococci alone	24		
AB_{13}, Cevil strain gave maximal reaction in		6	
NY_5, scarlet strain gave maximal reaction in		7	
Maith, septicemia gave maximal reaction in		5	
Lee, septicemia with arthritis gave maximal reactions in		6	
			24
Number reacting to viridans streptococci alone	3		
Lindsay gave maximal reaction in		2	
Waller gave maximal reaction in		1	
			3
Number giving maximal reaction to hemolytic streptococci, but reacting to both types	25		
AB_{13} gave maximal reaction in		2	
NY_5 gave maximal reaction in		7	
Maith gave maximal reaction in		10	
Lee gave maximal reaction in		6	
			25
Number giving maximal reaction to viridans streptococci, but reacting to both types	3		
Giordani gave maximal reaction in		1	
Tschetter, joint, gave maximal reaction in		2	
			3
			55
Total number with maximal reaction to hemolytic streptococci	49, 90%		
AB_{13} gave maximal reaction in		8	
NY_5 gave maximal reaction in		14	
Maith gave maximal reaction in		15	
Lee gave maximal reaction in		12	
			49
Total number with maximal reaction to viridans streptococci	6, 10%		
Tschetter gave maximal reaction in		2	
Giordani gave maximal reaction in		1	
Lindsay gave maximal reaction in		2	
Waller gave maximal reactions in		1	
			6
			55

The patients were tested with from fifteen to twenty suspensions prepared in this way. One-tenth cc. of the suspension was injected intradermally on the volar surface of the forearm and the results were read from eighteen to twenty-four hours later. An area of erythema 1 cm. in diameter or larger was considered a positive reaction. In most instances the reaction was larger, varying from 1 to 5 cm. in diameter, in the center of which was an area of induration varying from 0.5 to 2 cm. in diameter in direct proportion to the size of the area of erythema. In all instances the reaction was tuberculin-like in appearance and in one instance was sufficiently violent to progress to the stage of necrosis in the central portion. In all, fifty-five cases of chronic rheumatoid arthritis were tested. The results of the tests are shown in table 3.

It will be seen that in this series all the patients gave a positive skin reaction to at least one strain of streptococcus. The number of strains to which each subject reacted varied; in but three instances did a reaction occur to only a single strain; the average number of

positive reactions was to four strains and the maximum number to twelve strains. In twenty-four instances, or 43 per cent, there was a positive reaction to one or more hemolytic strains only. No single strain predominated in causing the maximal reaction, these marked reactions being divided equally among four of the strains. In only three instances did a positive reaction occur to a viridans strain alone, and in two of these only single positive reactions were obtained. In twenty-eight cases, positive reactions were obtained with antigens of both hemolytic and green strains. In this group twenty-five showed the maximal reaction to a hemolytic strain, whereas in only three was the greatest reaction obtained with a green strain. The distribution among the hemolytic strains was not uniform, ten of the twenty-five showed the maximal reaction to Maith strain, obtained from a case of streptococcic septicemia; NY_5 a scarlet strain and Lee, a strain obtained from a case of streptococcic septicemia with arthritis, showed the maximal reaction in about an equal number, seven with the former and six with the latter; AB_{13} showed the maximal reaction in two instances. Therefore, in a series of fifty-five cases, all reacting intradermally to one or more strains of the streptococci with which they were tested, forty-nine, or 90 per cent, showed the maximal reaction to a hemolytic strain, whereas only six, or 10 per cent, showed the greatest reaction to a green strain.

I shall make no attempt to interpret these results in terms of causation but wish merely to record the results. These results were useful for our purpose, since they indicated clearly to which particular strain of streptococcus, among the many used, each patient was especially sensitive.

VACCINE TREATMENT

The problem we had set ourselves was to determine the changes that would occur in the diseased joints concomitantly with a gradual reduction of skin sensitiveness following the repeated injection of the antigen to which the patient was especially sensitive. An analogous situation exists in certain instances of choroiditis. This lesion is essentially inflammatory but nonspecific. It is generally thought that these choroidal lesions are in some way related to tuberculous infection, but speaking strictly one cannot say that they are tuberculous, since they possess none of the characteristic histologic features of tuberculous disease of the choroid. The assumption that they are related to tuberculosis rests chiefly on the fact that these inflammatory reactions in the choroid occur nearly always in the presence of marked tuberculin hypersensitiveness as demonstrated by the intradermal test, although in most instances there is no demonstrable tuberculous disease elsewhere in the body. All that one can say definitely is that a choroiditis exists in the presence of a high grade of tuberculin hypersensitiveness, and that the lesions almost always do well when the patients are desensitized to tuberculin.

Swift[16] and his co-workers have shown that subcutaneous injections of killed nonhemolytic streptococci tend to sensitize rabbits, whereas similar injections given intravenously tend to make them immune. This observation decided us to use the intravenous route in giving the treatments. We were solicitous in our efforts to avoid general reactions and at the same time to minimize the possibility of the effects of foreign protein shock reactions such as follow, for instance, the intravenous injection of typhoid vaccine.

The vaccine was prepared for each case from the strain to which the maximal skin reaction was obtained. It was a heat killed salt solution suspension of organisms, previously grown in beef infusion broth for twenty-four hours, so diluted for the initial dose that 0.5 cc. contained approximately five million heat killed organisms. No preservative was added.

An intravenous injection of 0.5 cc. was given as the initial dose and in most instances little or no constitutional reaction followed the injection. No set rule was followed in administering subsequent doses of the vaccine. The increase in dosage was gaged entirely by the patient's response. When any constitutional reaction occurred, manifested by fever, the dose was very slowly increased, keeping below the amount sufficient to produce fever. Otherwise the injections were made at four day intervals and each dose increased by 0.5 cc. If on account of a severe skin reaction it was feared that a constitutional reaction might occur, the strength of the initial dose of vaccine was decreased and the increase in dosage carefully gaged by the patient's response. In this way constitutional reactions were kept at a minimum, indeed almost entirely eliminated.

During the first period of treatment the patients were kept in the hospital, in most instances in bed, a necessary precaution in many cases on account of the severe involvement of the knee joints. No other treatment was employed except the use of salicylates and sedatives as was necessary for the alleviation of pain. The injection of vaccine was continued at four day intervals during the stay in the hospital, which was from four to eight weeks' duration. Following discharge the interval was lengthened to seven days and the patients returned to the outpatient department for treatment, except in those instances in which the involvement of the joints of the lower extremities made this impossible.

Twenty-eight cases have so far been treated for periods ranging from two months to over one year. Of this number twenty-five patients had definite chronic rheumatoid arthritis, three suffered from combined arthritis in which the rheumatoid features predominated. In all cases symptoms and signs of the disease had been present for at least six months, the average duration being approximately two years. All foci of infection had been removed and sufficient time allowed to elapse to convince us that no benefit or further benefit would follow. Under treatment, twenty-one cases, or 75 per cent, have shown evidence of definite improvement.

The improvement manifested itself by reduction of pain, reduction of soft tissue swelling and increased mobility of the joint. In joints in which bone destruction and true ankylosis had occurred, the mobility could not be increased but pain and soft tissue swelling were reduced. It has not been unusual to see fusiform swelling of the fingers decrease in size and in some instances disappear altogether. Eight patients were bedridden when treatment was begun; five of these are now out of bed and able to move about; two of the remaining three have been under treatment barely two months; the third has been treated for five months. The two under treatment only two months have shown definite improvement, whereas the one treated for five months has not been appreciably benefited. In all three cases there was extensive involvement of the knees.

16. Swift, H. F.: Pathogenesis of Rheumatic Fever, J. Exper. Med. **39**: 497 (April) 1924.

Although constitutional reactions have been absent or minimal, the patients have rather uniformly complained of focal reactions, indicated by increased pain in the involved joints for twenty-four hours after the injections. Following this reaction the joints have been less painful. Amelioration of symptoms has appeared gradually, becoming definite usually after from three to five weeks, and from then on progressing slowly. The course of improvement has not been uniform in all cases; at times joints flare up during treatment but subside in a shorter time than is usual in the spontaneous remissions of chronic arthritis. Although improvement has not been obtained in all cases, in no instance has there been any untoward effect; nor has an aggravation of the condition resulted from the treatment.

Seven cases have failed to show any definitely favorable response. In three of these we were disappointed because in the light of the response made by other patients it seemed reasonable to anticipate improvement. Two of these, however, have been under treatment only a short time. Two of the remaining five cases gave a history of long standing joint involvement with pain as the chief symptom, whereas the inflammatory process was relatively inactive. In the remaining two cases a combined arthritis was present.

Twenty-six of the cases showing the maximal skin reaction to a hemolytic strain have been treated with hemolytic streptococcus vaccine. In nine instances the Maith strain, obtained from a case of hemolytic streptococcus septicemia, was used. In nine cases NY_5, a scarlet strain, was used; in four, AB_{13}, a "typical" strain furnished us by Cecil, Nicholls and Stainsby; in four, the Lee strain, obtained from a case of hemolytic streptococcus septicemia with acute infectious arthritis. The viridans strains used were Tschetter, isolated from a knee joint, and Waller, a stock laboratory strain from an unknown source.

During the course of treatment the skin reaction to the strain employed has uniformly diminished in intensity and frequently disappeared entirely. The agglutinating power of the patient's serum has materially increased, and those patients whose serum failed to agglutinate the organism before treatment was begun gradually developed agglutinins for the organism used in treatment. The increase in titer varied from 1:1,280 to 1:10,240 and was occasionally as high as 1:20,480. In one of the cases in which a green strain was used, agglutination was absent before treatment was given but appeared shortly after and rose gradually until it was present in a dilution of 1:10,240. In the second case no agglutination of the organism used in treatment has ever developed.

We determined the sedimentation rate of the erythrocytes in only a small number of our cases. In these few the rate decreased as improvement took place but in none did it reach normal.

COMMENT

Our efforts to recover streptococci from the blood and joints of cases of chronic rheumatoid arthritis have completely failed. In one instance a Streptococcus viridans was obtained but it was present for only a short time, and I feel that this must be regarded as a transient bacteremia. In reporting these results I realize that the limited number of cases does not warrant any sweeping conclusions but wish merely to record our failure to corroborate the work of those investigators who find streptococci in the blood and joints in a large proportion of cases of rheumatoid arthritis.

On the other hand the presence of agglutinins for hemolytic streptococci in the serums of patients suffering from chronic rheumatoid arthritis seems well established. A positive reaction does not indicate of necessity a causal relationship between hemolytic streptococci and rheumatoid arthritis but it does suggest that streptococci play a rôle in the disease. Agglutination may be due to the presence of natural rather than acquired or specific agglutinins, as Dawson, Olmstead and Boots [11] suggest, but the frequency with which it occurs in rheumatoid arthritis is the most incriminating evidence thus far produced against the streptococcus in this disease and merits some consideration.

The presence of skin sensitivity to streptococci does not necessarily indicate that there is also joint sensitivity or general sensitivity. The objections raised by Short, Dienes and Bauer [17] to the interpretation of skin reactions to autogenous vaccines, namely, that they may indicate varying irritability of the patients' skins, natural toxicity of the bacterial species or perhaps sensitization to certain bacterial groups, must be considered. However, the effect on the reactions of subsequent treatment with vaccines indicates that they do represent a specific skin sensitivity to the strain used.

I am not prepared to offer an interpretation of the changes occurring after intravenous injection of vaccine. I do not know that the diminution and disappearance of the skin reaction is a measure of desensitization or that the increase in the agglutinating power of the patient's serum is a measure of immunity. However, I do feel that the skin reaction is the most definite evidence of hypersensitiveness we could obtain and wish to cite the observations we have made and record the improvement which has taken place in the patients we have treated. I realize that any claim to specificity could be justifiably disputed and that it is not beyond the realm of possibility that the improvement brought about is the result of treatment which is nonspecific in character. We have succeeded in eliminating or at least minimizing the feature of nonspecific therapy to which is commonly attributed the benefit derived from vaccine treatment. The evidence of improvement has appeared fairly early, but the long continued use of vaccine may be of further value.

SUMMARY

1. Ninety-four blood cultures in ninety-one cases of rheumatoid arthritis yielded Streptococcus viridans in one case, diphtheroids in four cases, staphylococci in four cases and gram-positive bacilli in three cases.

2. Fourteen joint cultures in fourteen cases of rheumatoid arthritis were negative.

3. The serums of forty-six, or 90 per cent, of fifty-one cases of rheumatoid arthritis were found to possess agglutinins for hemolytic streptococci.

4. All of fifty-five cases of rheumatoid arthritis gave positive skin reactions to one or more strains of streptococci.

5. Twenty-one of twenty-eight cases of rheumatoid arthritis have shown improvement following intravenous injections of streptococcus vaccine prepared from the strain to which the skin was most sensitive.

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17. Short, C. L.; Dienes, L., and Bauer, W.: Autogenous Vaccines in Rheumatoid Arthritis, Am. J. M. Sc. **187**: 615 (May) 1934.

IS THERE A SCARLET FEVER TOXOID?

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In early studies of diphtheria toxin, it was observed that on standing the toxin undergoes spontaneous change resulting in loss of toxicity. But this loss of toxicity is not accompanied by corresponding loss in ability to neutralize diphtheria antitoxin. In elaborating his theory of immunity, Ehrlich employed the term "toxoid" to designate this nontoxic substance which is still able to bind antitoxin. The French prefer the term "anatoxin" for this substance. The change from toxin to toxoid, which takes place spontaneously in solutions of diphtheria toxin, may be hastened by addition of certain chemicals. Ramon used formaldehyde to accelerate and complete the change from diphtheria toxin to toxoid and utilized the formolized product for active immunization. He found the same method useful in obtaining toxoid from tetanus toxin. Toxoids that have lost their toxicity but retain the ability to neutralize and stimulate the production of antitoxin are satisfactory agents for active immunization against some diseases in which soluble toxins are concerned.

Scarlet fever toxin kept at icebox temperature in nonsoluble glass containers does not undergo spontaneous loss of toxicity comparable to the change noted in diphtheria toxin. However, attempts have been made to obtain a scarlet fever toxoid through treatment of the toxin with formaldehyde.

In this article the expression "solution of formaldehyde" is used in the sense of the U. S. Pharmacopeia to designate a solution containing not less than 37 per cent of formaldehyde gas.

Zoeller [1] studied the effect of formaldehyde on scarlet fever toxin in solutions to which he added from 0.25 to 1 per cent of a 40 per cent solution of formaldehyde before storing at 38 to 39 C. for a period of thirty days. From standardization by means of skin tests before and after treatment with formaldehyde, Zoeller determined that addition of 0.25 to 0.5 per cent solution of formaldehyde did not produce appreciable attenuation of the toxin. One per cent solution of formaldehyde caused considerable attenuation, but detoxification was not complete even when 2 per cent solution of formaldehyde was used. Sparrow and Celarek [2] added 0.5 per cent solution of formaldehyde and stored the preparation six weeks at 38 C. They then used this material in immunization experiments and reported 88 per cent of 143 susceptible children immunized by 3 cc. of the formolized toxin. Smith [3] titrated his toxin before and after treatment with formaldehyde. Like Zoeller, Smith found marked loss of toxicity following addition of 2 per cent solution of formaldehyde and but slight detoxification in mixtures containing from 0.5 to 1.0 per cent. None of Smith's preparations were completely detoxified. Injecting 3 cc. of formolized toxin, he obtained immunity in from 52 to 56 per cent. Debré and Ramon [4] used 0.5 per cent of a 40 per cent solution of formaldehyde and stored the preparation at from 38 to 40 C. for from one month to six weeks. In subsequent immunization experiments they found that the less toxic preparations that caused fewer reactions produced less immunization than the more toxic samples. Mureddin [5] used a formolized mixture of scarlet fever and diphtheria toxin to which 0.4 per cent solution of formaldehyde was added before incubation at from 38 to 39 C. for only four to five days. He injected graduated doses of this mixture, totaling 3 cc. in children susceptible to both scarlet fever and diphtheria, and reported that 81 per cent developed negative skin tests, indicating immunity to both diseases. Mureddin standardized the diphtheria but not the scarlet fever toxin before and after treatment with formaldehyde. Futagi [6] employed scarlet fever toxin to which 0.4 per cent of a 30 per cent solution of formaldehyde was added before storage at temperatures ranging from 40 to 48 C. for periods varying from seven to sixty days. With these different preparations of formolized toxin injected in four doses totaling 3.8 cc., the immunity obtained varied from 25 to 84.5 per cent, compared with 99.3 per cent following administration of 26,000 skin test doses of unmodified toxin. This author did not state the titer of the toxin after treatment with formaldehyde. Veldee [7] of the United States Public Health Service recommends use of the acetone insoluble portion of the toxin containing broth filtrate redissolved in broth, treated with 0.4 per cent solution of formaldehyde and stored at 37 C. for about sixty days. Veldee attempts to determine the amount of residual toxin by means of skin tests on rabbits and advises the further addition of 0.05 per cent solution of formaldehyde if tests on rabbits indicate insufficient detoxification. He reported 87.3 per cent susceptibles immune on retest after three doses consisting of 0.1, 0.5 and 1 cc. of his formolized preparation.

In considering results of previously published work, it is noted that none of the authors were able completely to detoxify scarlet fever toxin, though some used as high as 2 per cent of a 40 per cent solution of formaldehyde. Zoeller and Smith determined the degree of detoxification with different amounts of formaldehyde and agree that there is comparatively little loss of toxicity following the addition of the smaller amounts of solution of formaldehyde up to 0.5 per cent. In this connection it is significant that preparations of scarlet fever toxin containing the largest amounts of formaldehyde gave the lowest percentage of immunity following injection of the formolized toxin, while the best results have been reported by authors who used less than 0.5 per cent solution of formaldehyde. This suggests that reduction in toxicity on addition of formaldehyde to scarlet fever toxin may not be due to conversion of the toxin into a true toxoid. The better results obtained with toxin treated with smaller amounts of formaldehyde might be due to the presence of larger amounts of unaltered toxin remaining in such solutions.

Apparently most investigators have been so influenced by analogy between the soluble toxins of the diphtheria bacillus and the scarlet fever hemolytic streptococcus that they have assumed the partial loss of toxicity on treatment of scarlet fever toxin with

1. Zoeller: Compt. rend. Soc. de biol. **92**: 244-245 (Feb.) 1925.
2. Sparrow, H., and Celarek, J.: Compt. rend. Soc. de biol. **97**: 957-959 (Oct. 13) 1927.
3. Smith, J.: Brit. J. Exper. Path. **9**: 49-54 (April) 1928.
4. Debré, R.; Ramon, G., and Petot, C.: Rev. d'hyg. **52**: 881-898 (Dec.) 1931.
5. Mureddin: Compt. rend. Soc. de biol. **103**: 1200-1202 (May 1) 1930.
6. Futagi, Y.: J. Immunol. **19**: 451-456 (Nov.) 1930.
7. Veldee, M. V.: Pub. Health Rep. **48**: 549-565 (May) 1933.

formaldehyde was necessarily due to conversion of the toxin into toxoid. Without other basis, some have described the formolized toxin as "scarlet fever toxoid" and, in interpreting the results of immunization experiments, have ignored the possible effect of the unaltered toxin remaining in the formolized preparations. Veldee carried the analogy further in advising the addition of alum to precipitate the scarlet fever toxoid before injection.

The following experiments, begun in 1927, were undertaken to learn whether the addition of formaldehyde to scarlet fever toxin results in the formation of a scarlet fever toxoid, nontoxic but capable of binding scarlet fever antitoxin, and capable of stimulating the production of antitoxin when injected into susceptible individuals.

IMMUNIZATION EXPERIMENTS WITH FORMOLIZED TOXIN

1. One liter amounts of a broth culture filtrate containing toxin specific to scarlet fever were placed in glass stoppered Pyrex flasks. A neutral 37 per cent solution of Merck's reagent formaldehyde was added in 1, 2, 3, 4, 5, 6, 8 and 10 cc. amounts to different flasks, and to one flask no solution of formaldehyde was added. All flasks were sealed and kept in an incubator at 38 C. for a period of six weeks. At the end of this time the toxin remaining unchanged in each flask was titrated by means of skin tests on susceptible human beings compared with the results of skin tests made simultaneously on the same individuals with one standard skin test dose of scarlet fever toxin. Toxin in the flask to which no formaldehyde had been added contained 37,500 skin test doses per cubic centimeter. There was some loss of toxicity in all flasks containing formaldehyde, but detoxification was not complete in any flask. Loss of toxicity was in proportion to the amount of formaldehyde. Samples from flasks to which less than 0.5 per cent solution of formaldehyde had been added still contained more than half of the original amount of toxin. The greatest loss of toxicity occurred in the flask to which 1 per cent solution of formaldehyde had been added. Accurate standardization showed that in this flask the original toxicity of 37,500 skin test doses per cubic centimeter had been reduced to 4,000 skin test doses per cubic centimeter. This material was used in subsequent immunization experiments in a total dosage ranging from 2.675 to 13.675 cc. In control experiments 3.2 cc. of toxin from the flask containing no formaldehyde were injected in five graduated doses. Of sixty-seven susceptible young adults between the ages of 18 and 30 years in this control series, 91 per cent were immune to one skin test dose on retest two weeks after the last injection. At first the formolized toxin was injected undiluted in doses of 0.125, 0.5 and 2 cc., but when it was found that this dosage did not confer immunity in most cases the amount injected was gradually increased up to 13.675 cc. given in the following doses of undiluted material: first dose, 0.125 cc.; second dose, 0.5 cc.; third dose, 2 cc.; fourth dose, 3 cc.; fifth dose, 4 cc.; sixth dose, 4 cc.

Fifteen, or 75 per cent, of twenty persons who received the larger dosage of formolized toxin developed immunity to one skin test dose of toxin.

Before the addition of formaldehyde, the 13.675 cc. had contained 512,812.5 skin test doses of toxin; yet injection of this amount of formolized toxin conferred less immunity than injection of 119,875 skin test doses of unmodified toxin; moreover, the 13.675 cc. of formolized toxin still contained 54,700 skin test doses of unaltered toxin which might account for all of the immunity obtained.

2. In the next experiment another lot of formolized toxin was used. This toxin originally contained 40,000 skin test doses per cubic centimeter and after incubation for two months with 0.8 per cent solution of formaldehyde the toxicity was reduced to 2,000 skin test doses per cubic centimeter. Injected in five doses of 0.25, 1, 3, 3 and 3 cc., this preparation conferred immunity in 52 per cent of 75 susceptible young adults. The total volume of 10.25 cc. had contained 410,000 skin test doses of toxin before treatment with formaldehyde and after treatment it still contained 20,500 skin test doses of unaltered toxin. In a control series of seventy-nine young adults, the untreated toxin given in five doses, totaling 2.9 cc. and containing 115,500 skin test doses, immunized 91 per cent.

This same formolized preparation was then employed in two schools, where nose and throat cultures were made on blood agar plates and all children showing hemolytic streptococci in nose or throat culture were excluded from school until immunization of the noninfected susceptibles had been completed. The 207 susceptible children between the ages of 5 and 19 years were divided into two groups. One group received the formolized toxin in the first three immunizing doses and untreated toxin in the last two doses as follows:

First dose of formolized toxin	0.25	cc.
Second dose of formolized toxin	1	cc.
Third dose of formolized toxin	4	cc.
Fourth dose of untreated toxin	0.625	cc.
Fifth dose of untreated toxin	2	cc.
Total	7.875	cc.

The other group received unmodified toxin of the same lot used in producing the formolized toxin in the following dosage:

First dose of untreated toxin	0.0125	cc.
Second dose of untreated toxin	0.05	cc.
Third dose of untreated toxin	0.2	cc.
Fourth dose of untreated toxin	0.625	cc.
Fifth dose of untreated toxin	2	cc.
Total	2.8875	cc.

Since this formolized toxin contained 2,000 skin test doses of unaltered toxin per cubic centimeter, the amount of unmodified toxin injected in each series was the same: 115,500 skin test doses. But in addition to the unmodified toxin injected in both groups, the first group received 199,500 skin test doses of detoxified toxin. If the detoxified portion of the formolized toxin contained toxoid capable of stimulating the production of antitoxin, the group that received 5.25 cc. of the formolized toxin in addition to the unmodified toxin might be expected to show more immunity than the second group, which received only the unmodified toxin. This was not the case. The development of immunity in the two groups was practically the same, being 95.3 per cent in the 103 children who received only the untreated toxin and 94.2 per cent in the 104 children who received the formolized toxin in addition to the unmodified toxin.

3. In the next experiment a third preparation was employed. This toxin also originally contained 40,000 skin test doses per cubic centimeter and its toxicity was reduced to 4,000 skin test doses per cubic centimeter after treatment with formaldehyde. It was used in two orphanages after nose and throat cultures as well as skin tests had been made on every one and all those infected with hemolytic streptococci had been quarantined from noninfected susceptibles. In these institutions there were 118 noninfected susceptibles. To half of these in each institution the formolized toxin was given in the doses shown in table 1. In the other half, untreated toxin of the same lot used to produce the formolized toxin was given in the doses shown in table 2.

If the 94,500 skin test doses of toxin that had been detoxified in the 2.625 cc. of the formolized toxin had been converted into toxoid, the group that received the formolized toxin should have shown considerably more immunity on retest than those who received only 0.2625 cc. of the untreated toxin. Two weeks after the third dose was given, retests were made. These showed practically the same degree of immunity in the two groups. Of the fifty-nine children who received the formolized preparation, twenty-five, or 42 per cent, were immune to one skin test dose of toxin, and twenty-four, or 40.6 per cent, were immune in the other group.

Immunization in both groups was continued by injection of 25,000 and 100,000 skin test doses of the untreated toxin. Following this, skin tests showed 97 per cent immune.

Results of these experiments indicate that, although incubation with 0.8 to 1 per cent of a 37 per cent solution of formaldehyde may cause detoxification of as much as 95 per cent of the toxin in a solution of scarlet fever toxin, no evidence is found that the detoxified portion possesses antigenic properties. Such immunity as resulted from injection of the formolized

TABLE 1.—*Dosage of Formolized Toxin*

Dose	Volume	Amount of Unmodified Toxin	Amount of Detoxified Toxin
1st	0.125 cc.	500 skin test doses	4,500 skin test doses
2d	0.500 cc.	2,000 skin test doses	18,000 skin test doses
3d	2.000 cc.	8,000 skin test doses	72,000 skin test doses
Total	2.625 cc.	10,500 skin test doses	94,500 skin test doses

TABLE 2.—*Dosage of Untreated Toxin*

Dose	Volume	Amount of Unmodified Toxin	Amount of Detoxified Toxin
1st	0.0125 cc.	500 skin test doses	0
2d	0.0500 cc.	2,000 skin test doses	0
3d	0.2000 cc.	8,000 skin test doses	0
Total	0.2625 cc.	10,500 skin test doses	0

toxin could be explained by the considerable amounts of unaltered toxin remaining in the solution.

On publication of Veldee's work from the United States Public Health Service, arrangements were made to use formolized scarlet fever toxin prepared by Veldee in the National Institute of Health. Veldee started with a stronger toxin than we had used and it was thought the better results which he reported might be due to the fact that he had used a stronger toxin for treatment with formaldehyde.

When received, the material was labeled "Scarlet Fever Toxoid." The label stated that its original toxicity had been 150,000 skin test doses per cubic centimeter and that after the addition of 0.35 per cent solution of formaldehyde and storage at 37 C. for eighty-eight days the toxicity had been reduced to 500

TABLE 3.—*Results of Skin Tests with Alum Precipitate of Scarlet Fever Toxin*

0.1 Cc. Solution of Alum Precipitate Diluted 1:500	0.1 Cc. Diluted Standard Toxin Containing 1 Skin Test Dose
Negative	30 × 30 mm. moderate red
Negative	21 × 16 mm. moderate red
Negative	16 × 15 mm. moderate red
Negative	26 × 14 mm. moderate red
Negative	18 × 15 mm. faint red
Negative	11 × 15 mm. moderate red
Negative	25 × 18 mm. moderate red
Negative	26 × 18 mm. moderate red
Diluted 1:200	
Negative	29 × 19 mm. moderate red
Negative	29 × 24 mm. faint red
Negative	24 × 18 mm. moderate red
Negative	21 × 14 mm. faint red
Negative	26 × 20 mm. moderate red

skin test doses per cubic centimeter. Two methods of immunization were recommended on the label, the first consisting of injection of 0.1, 0.5 and 1 cc. at intervals of three weeks and the second consisting of the addition of sufficient potassium alum to make the final solution contain 0.5 per cent alum and administration of two doses of 0.25 and 0.5 cc. measured before addition of the alum.

It is known that alum precipitates diphtheria toxin, but there was no evidence in the literature to indicate that scarlet fever toxin is precipitated by alum. To determine whether it would be advisable to add alum, the following experiment was made.

EXPERIMENTS TO LEARN THE EFFECT OF ALUM ON SCARLET FEVER TOXIN

Following the method described by Leonard and Holm[8] for diphtheria toxin and toxoid, 5 cc. of a 10 per cent solution of sodium alum was added to 50 cc. of an undiluted scarlet fever skin test toxin containing 15,000 skin test doses per cubic centimeter. The mixture was placed in the icebox for three hours, centrifugated and the supernatant fluid discarded. The precipitate was washed twice in 25 cc. distilled water, and treated with 2.4 per cent disodium acid phosphate. After centrifugation the remaining precipitate was dissolved in 5 cc. of 5 per cent sodium citrate solution and diluted to 50 cc. with 0.3 per cent sodium chloride containing 0.4 per cent phenol. This solution was sterilized by passage through a Berkefeld W porcelain filter.

The amount of toxin in the solution of the alum precipitate was determined by means of skin tests on susceptible human beings compared with the results of tests made on the same individuals with one standard skin test dose of toxin, with the results shown in table 3.

TABLE 4.—*Standardization of Unaltered Toxin in Veldee's "Toxoid"*

Reaction Produced by 0.1 Cc. of Veldee's "Scarlet Fever Toxoid" 1:800	Reaction Produced by One Standard Skin Test Dose of Scarlet Fever Toxin in 0.1 Cc.
21 × 13 mm. moderate red	25 × 15 mm. moderate red
28 × 20 mm. moderate red	28 × 20 mm. moderate red
28 × 17 mm. moderate red	28 × 15 mm. moderate red
28 × 17 mm. moderate red	29 × 19 mm. moderate red
21 × 18 mm. faint red	29 × 26 mm. faint red
26 × 18 mm. bright red	20 × 15 mm. bright red
Negative	13 × 10 mm. moderate red
13 × 12 mm. moderate red	15 × 10 mm. moderate red
19 × 17 mm. moderate red	14 × 15 mm. moderate red
21 × 18 mm. bright red	20 × 15 mm. faint red
22 × 16 mm. bright red	22 × 15 mm. bright red
23 × 17 mm. moderate red	28 × 18 mm. moderate red
40 × 24 mm. bright swollen	38 × 21 mm. bright swollen
34 × 20 mm. bright red	22 × 19 mm. bright red
19 × 12 mm. moderate red	17 × 10 mm. bright red
10 × 8 mm. moderate red	9 × 9 mm. moderate red
21 × 15 mm. faint red	20 × 14 mm. faint red
22 × 17 mm. moderate red	21 × 12 mm. moderate red
20 × 20 mm. moderate red	27 × 15 mm. moderate red
18 × 11 mm. moderate red	10 × 19 mm. moderate red

Diphtheria toxin was treated in the same way. Tests for the presence of diphtheria toxin in the redissolved precipitate were made by injection subcutaneously in 250 Gm. guinea-pigs.

One cubic centimeter of a 1:100 dilution of the original toxin caused a local reaction but did not kill the pig. One cubic centimeter of a 1:10 dilution killed a pig on the second day.

One cubic centimeter of a 1:50 dilution of the redissolved alum precipitate caused a local reaction. One and eight-tenths cubic centimeter of a 1:5 dilution killed a pig on the second day.

In this experiment no evidence of toxin was found in the alum precipitate from scarlet fever toxin, but toxin was demonstrated in the alum precipitate from diphtheria toxin. In view of these results it was decided to use the "scarlet fever toxoid" without the addition of alum.

IMMUNIZATION EXPERIMENTS WITH VELDEE'S "SCARLET FEVER TOXOID"

In a control group of seventy-eight persons susceptible to scarlet fever as shown by positive skin reactions to one skin test dose of scarlet fever toxin, five graduated doses of an unmodified scarlet fever toxin containing 45,000 skin test doses per cubic centimeter were injected at weekly intervals. The toxin in the smaller doses was diluted with physiologic solution of sodium chloride to facilitate accurate dosage. Retests made

8. Leonard, G. F., and Holm, A. J.: J. Infect. Dis. 53: 376-385 (Dec.) 1933.

two weeks after injection of the fifth dose showed seventy-seven persons, or 98.6 per cent, immune to one skin test dose of toxin.

At the same time in the same institution the "scarlet fever toxoid" was injected in a group of forty-one susceptible persons in three doses of 0.1, 0.5 and 1 cc. at intervals of three weeks, as Veldee suggests. Retests were made in this group one month after the last dose was injected. Thirty-five were retested, the others having left the institution or died in the interval of two and a half months. Of the thirty-five retested, fourteen, or 40 per cent, were immune to one skin test dose of toxin. In most of the others the skin reaction was modified though still positive.

In administering the "toxoid" no reactions were expected, because the label stated that it contained only 500 skin test doses of residual toxin per cubic centimeter. However, the reactions observed following the first dose of 0.1 cc. were such as to suggest that the patients had received considerably more than the fifty skin test doses of unchanged toxin indicated by the label.

Veldee used rabbits to determine how much unaltered toxin remained in solution following treatment with formaldehyde. Compared with human beings the rabbit is insusceptible to scarlet fever, as shown by the fact that the majority of rabbits show negative skin reactions to the standard skin test dose of toxin, which

TABLE 5.—*Comparative Results with Untreated Toxin and with "Scarlet Fever Toxoid" Prepared by Veldee*

	Untreated Toxin 5 Dose Series	Untreated Toxin 3 Dose Series	Veldee's "Toxoid" 3 Dose Series
Total volume injected	2.868 cc.	0.257 cc.	1.6 cc.
Total number of skin test doses of unmodified toxin injected	129,050	11,550	12,800
Total number of skin test doses of detoxified toxin injected	0	0	237,200
Per cent immunized	98.6%	36.7%	40%

gives positive reactions in susceptible human beings; by the fact that the scarlet fever rash is not produced in rabbits by intravenous injection of large amounts of toxin or by inoculation with living cultures of the scarlet fever streptococcus; also by the fact that scarlet fever toxin is inhibited by normal rabbit serum mixed with it in vitro before it is injected intradermally in susceptible human beings. This comparative insusceptibility makes the rabbit an unsuitable subject for accurate standardization of either scarlet fever toxin or scarlet fever antitoxin, since the latter is merely titration of free toxin left in the toxin-antitoxin mixture.

STANDARDIZATION OF UNMODIFIED TOXIN REMAINING IN VELDEE'S "TOXOID"

The amount of unchanged toxin remaining in the Veldee preparation was therefore standardized by means of skin tests on one arm of susceptible human beings compared with the reactions produced by injection of one standard skin test dose of toxin on the other arm. Results of tests made with 0.1 cc. of a 1:800 dilution of the "toxoid" are shown in table 4.

By this means it was learned that the preparation which as the result of tests on rabbits was labeled as containing 500 skin test doses of toxin actually contained 8,000 skin test doses of unchanged toxin per cubic centimeter.

Thus it was apparent that in giving the doses of 0.1, 0.5 and 1 cc. there had been injected along with the detoxified toxin 800, 4,000 and 8,000 skin test doses of unaltered toxin. To learn how much of the immunity obtained was attributable to the unmodified toxin present in the "toxoid," a group of forty-two young adults who had received the first three doses of untreated toxin usually given in routine immunization were retested before the fourth and fifth doses were

TABLE 6.—*Binding of Scarlet Fever Antitoxin by Untreated Toxin*

Case	0.1 Cc. Toxin Control Containing 2 Skin Test Doses of Toxin	0.1 Cc. Toxin-Antitoxin Mixture Containing 2 Skin Test Doses of Toxin and 5 Neutralizing Units of Antitoxin	0.1 Cc. Toxin-Antitoxin Mixture Containing 6 Skin Test Doses of Toxin and 5 Units of Antitoxin	Antitoxin Control
1	22 × 19 mm. moderate red	Negative	9 × 11 mm. moderate red	Negative
2	34 × 25 mm. moderate red	Negative	11 × 11 mm. moderate red	Negative
3	21 × 20 mm. moderate red	Negative	16 × 11 mm. faint red	Negative

given. It was found that sixteen, or 36.7 per cent, were immune to one skin test dose of toxin. The total amount of toxin given in this group was somewhat less than the total amount of unmodified toxin injected in the three doses of the formolized preparation. If the detoxified portion of the formolized preparation had possessed antigenic properties, the group receiving the formolized toxin should have shown as much immunity as those who received five doses of untreated toxin, instead of less than half that immunity. Also the group that received the formolized toxin should have shown considerably more immunity than those who received only three doses of untreated toxin; yet the immunity in the two groups was practically the same, indicating that the detoxified portion of the formolized preparation had little if any antigenic action.

That failure to develop more immunity in the "toxoid" group was not due to any peculiarity of the individuals composing the group was learned by injecting the fourth and fifth doses of untreated toxin, after which retests showed all but one, or 97.1 per cent, com-

TABLE 7.—*Failure of Detoxified Toxin to Bind Scarlet Fever Antitoxin*

Case	Veldee's "Toxoid" 0.1 Cc. Containing 2 Skin Test Doses of Unaltered Toxin and 37.5 Skin Test Doses of Detoxified Toxin	0.1 Cc. "Toxoid"-Antitoxin Mixture Containing 2 Skin Test Doses of Unaltered Toxin, 37.5 Skin Test Doses of Detoxified Toxin and 5 Units of Antitoxin	0.1 Cc. "Toxoid"-Antitoxin-Toxin Mixture Containing 5 Skin Test Doses of Unaltered Toxin, 37.5 Skin Test Doses of Detoxified Toxin and 5 Units of Antitoxin	Antitoxin Control
4	27 × 20 mm. moderate red	Negative	Negative	Negative
5	11 × 10 mm. moderate red	Negative	Negative	Negative
6	22 × 15 mm. faint red	Negative	Negative	Negative

pletely immunized. Thus the children in the "toxoid" group had received the full amount of unmodified toxin given in the control group before their immunity was comparable to that in the control group.

Having failed to demonstrate the existence of a "toxoid" in the formolized scarlet fever toxin by means of immunization experiments in susceptible human beings, we attempted to demonstrate a nontoxic substance capable of binding scarlet fever antitoxin in Veldee's formolized scarlet fever toxin.

EXPERIMENTS TO DETERMINE WHETHER THE DETOXIFIED PORTION OF FORMOLIZED TOXIN IS ABLE TO BIND SCARLET FEVER ANTITOXIN

Some of Veldee's formolized toxin used in the preceding experiment was diluted 1:200 so that each 0.1 cc. contained four skin test doses of unchanged toxin and seventy-one skin test doses of detoxified toxin. This was mixed with an equal volume of scarlet fever antitoxin diluted so that each 0.1 cc. contained sufficient antitoxin to neutralize ten skin test doses of toxin. The "toxoid"-antitoxin mixture contained in each 0.1 cc. two skin test doses of unmodified toxin, 35.5 skin test doses of detoxified toxin, and enough antitoxin to neutralize five skin test doses of toxin. This mixture was allowed to stand in the incubator two hours, and to half of it sufficient untreated toxin was added to make the toxin content in each 0.1 cc. five skin test doses, or the full amount necessary to bind the antitoxin. As a control the same untreated toxin used in the mixtures described, containing 20,000 skin test doses per cubic centimeter, was diluted 1:500 so that it contained four skin test doses in each 0.1 cc. and combined with antitoxin and additional toxin in the same proportions used in the "toxoid" experiment except that, instead of three additional skin test doses of toxin in each 0.1 cc., four additional skin test doses were added, or one more skin test dose of toxin than the amount of antitoxin used should be able to neutralize.

"Toxoid," toxin and antitoxin control mixtures were also prepared, physiologic solution of sodium chloride being substituted for the "toxoid," toxin or antitoxin in the mixtures. After it had stood in the icebox overnight, 0.1 cc. of each solution was injected intradermally in persons susceptible to scarlet fever.

From the results in table 6 it is apparent that, if one more skin test dose of toxin is added to the toxin-antitoxin mixture than the antitoxin present can hold in combination, the excess toxin is manifested in a positive skin reaction.

If the 37.5 skin test doses of detoxified toxin in 0.1 cc. of the "toxoid"-antitoxin mixture had had combining power equivalent to one skin test dose of unaltered toxin, the skin reactions would have been positive with the "toxoid"-antitoxin mixture to which toxin was added after incubation as they were in the corresponding mixture in which untreated toxin was used instead of "toxoid." This was not the case.

RABBIT IMMUNIZATION EXPERIMENTS

Experiments were made in immunization of rabbits by injecting intravenously in three rabbits the formolized toxin prepared by Veldee. Untreated scarlet fever toxin was injected in a second group of three rabbits, and sterile, uninoculated broth in three rabbits. A dilution was made of the untreated toxin, which contained in each cubic centimeter an amount of toxin exactly equal to the unaltered toxin remaining in each cubic centimeter of the undiluted formolized preparation. Before injection, all rabbits showed positive reactions to fifty skin test doses of toxin injected intradermally on the ear. The intravenous injections were made at intervals of two weeks, beginning with 1 cc. and increasing to 20 cc. Before each dose the skin test was repeated. The rabbits in the control group injected with broth continued to show positive reactions. The rabbits injected with the diluted, untreated toxin developed negative skin reactions as early as those which received the undiluted formolized toxin.

Thus these experiments failed to demonstrate any antigenic substance in the formolized toxin other than the unaltered toxin remaining in it.

CONCLUSIONS

1. Scarlet fever toxin is partially but not completely detoxified by treatment with solution of formaldehyde up to 1 per cent. The presence of unaltered toxin in the formolized preparation is sufficient to account for the immunity obtained.

2. No evidence now available justifies the assumption that there is a scarlet fever toxoid analogous to diphtheria toxoid.

3. Alum precipitates diphtheria toxin and the toxin may be demonstrated in the precipitate; but the redissolved alum precipitate from scarlet fever toxin showed no evidence of the presence of toxin.

4. The rabbit is not a suitable subject for standardization of scarlet fever toxin.

5. Since the detoxified portion of formolized scarlet fever toxin is not antigenic, it is inferior to unmodified toxin as an immunizing agent because of the unnecessary amount of useless foreign protein which it contains.

THE SYNDROME OF HYPERTONIC AND ATONIC COLOPATHY

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Colitis is a much used and abused term, and most certainly the medical profession should limit its application to include only inflammatory states of the large bowel. These inflammations, from simple catarrhal to chronic ulcerative colitis, as well as related conditions producing definite pathologic lesions, have been well demonstrated, and their causative agents have been determined, ranging from chemical poisons, certain deficiency states, as noted in pellagra and sprue, protozoan infestations and, above all, bacterial infections.

A diagnosis establishing a case of acute or chronic bowel disorder, in the foregoing category, as an actual colitis affords some satisfaction in classifying the disorder and some comfort in the knowledge that one may proceed with therapy more or less promising and universally recognized. There still remain chronic constipation and intermittent diarrhea to plague, confound and divide the profession. These complaints represent by far the greater proportion of chronic bowel disorders that occur without any evidence of definite pathologic lesions of the mucous membrane.

ETIOLOGY

As in migraine, so in the more chronic colopathies characterized by constipation and intermittent diarrheic episodes, the cause of the condition has been assigned, on the one hand, to constitutional and functional factors and, on the other, to local irritative lesions or more general metabolic disorders. The latter conception would seek out and eliminate all neighborhood irritative factors that may arise intermittently, such as local disease in the rectum, pelvis or abdomen. It would correct also those presenting a general constitutional effect, such as certain food intolerances due to intestinal allergy or to an unfavorable intestinal flora-producing fermentation and congestion.

It must be admitted that adjacent inflammatory or irritative foci, namely, chronic appendicitis, disease of the gallbladder and pelvic disorders, and local rectal lesions (rectal ulcers, retention crypts, fistulas and hemorrhoids), as well as those other disturbances already noted, may produce secondary bowel disorders. Still the clinician, as a rule, is disappointed in the results

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obtained by treatment of these conditions alone, and by necessity of failure to gain much or even any improvement in his patient's symptoms has come to realize that the fundamental problem has not been solved. Therefore more attention has been paid to the functional elements, which has led to a study and analysis of the form of the colon, as exemplified by variations in length, loops, tone and position, and to the motor activity and function of the disturbed bowel, in order to understand the factors that affect and control it.

As in migraine, students of the more chronic colopathies, described later in more detail, recognize a probable congenitofunctional origin, since the causes of chief influence are partly congenital but inherently functional, and are manifested by certain psychic and autonomic disturbances of the nervous system.

COLON FORM AND FUNCTION

This critical study of the large bowel has led to knowledge of a usual or normal colon form; to redundancies or increased lengths with various loopings in different portions; to hypertrophy of sections of the bowel wall with dilatation, as in megacolon, and to what Larimore [1] calls "hyperrotation" of the cecum, or low descent. Any or all of these, with the possible exception of megacolon (which is typically atonic), may give rise to either diarrhea or constipation at various periods.

Further investigation of motor function has demonstrated phases of hypotonicity and hypertonicity in the colon leading to the classification, on the one hand, of atonic constipation and, on the other hand, of spastic constipation and mucous colitis. While apparently opposite conditions, they are undoubtedly fundamentally related; in all there is evidence of a constitutional and functional disturbance or imbalance of the autonomic nervous system, even though there is congenital variation in the form of the colon.

With a history of constipation and roentgen evidence of a relaxed or apparently dilated colon, usually a diagnosis of atonic constipation is made, and the physician has been content to treat the condition as such, in the accepted manner, with a bulky diet containing roughage, with various laxatives or other form of bowel stimulation and, much too frequently, with prolonged rectal and high colonic irrigations. In a surprisingly large proportion of such cases, mucous outpouring and diarrhea ensue, so that from an atonic regulatory regimen one must reverse to that of hypertonicity and irritability, because of evidence of most of the characteristics of irritable colon and mucous colitis.

Atonic as well as hypertonic states exist and can be demonstrated roentgenologically. Either may produce obstinate constipation, but it has been my observation that the two are more likely to occur at different times in the same individual than to characterize uniformly the bowel habitus of one person as against that of another. Any of the bowel-form types noted may show irritability, which is characteristic of hypertonia, or may be apparently atonic.

ATONIA

However, there is a uniform tendency for hypertonicity to be more apparent in shorter and more normal forms, whereas atonic loops and states appear more frequently as the bowel becomes more redundant. Finally, the only consistently atonic cases are found in the more serious redundancies, which may lead to volvulus, and in megacolon, where there is a local organic thickening or hypertrophy of the bowel wall in the part affected, as well as a congenital overaction of the sympathetic nervous system leading to dilatation. After many such cases have been observed, evidence accumulates that long before bowel "paralysis" or atonia becomes persistent, increasing degrees of decompensation or stretching appear, as the result of gradual development of autonomic nerve imbalance.

I myself have felt for a long time that the designation "atonic form" of constipation is misleading. By following the barium meal down the bowel with the fluoroscope and later supplementing these observations with the barium enema, I have learned that constipation due to uniform relaxation of the colon tube is rarely seen and possibly never exists throughout the whole length of the bowel at one time. It is conceded that there are regions of relaxation as there are of spasticity at times, and these vary. But it is the incoordination of muscular motor function rather than its paralysis or absence that is at the base of all constipation, except in the definitely mechanical obstructive types. One often sees relaxed, distended loops of bowel in redundant colons and very frequently dilated boggy cecums hanging low in the pelvis; but the spasticity and overirritability of other parts of the tract have seemed responsible for the loss of tone and of the decompensation apparent in these saccular loops and pouches. Atonia is relatively infrequent in the shorter bowel forms. It becomes apparent in the decompensated bowel segments of marked redundancies and in megacolon, and in these less evidence of hyperirritability appears, less of the functional make up of the hypervagotonic. In addition, there is an overacting sympathetic system which tends to continue the "status quo" in apparently dilated and decompensated large loops of bowel. The problem in these relatively few cases is to relieve the bowel stretching and decompensation and by various means block out the influence of the sympathetic system.

AUTONOMIC CONTROL

The main factors involved are the relative activity at various periods of the parasympathetic and sympathetic divisions of the autonomic nervous system. The parasympathetic (craniosacral), notably the vagus, is the activator, carrying fibers that increase secretion, produce spasticity and motor activity, and, if overstimulated, cause the excessive formation of mucus and lead to colic and hyperirritability. The sympathetic system (with its paravertebral ganglions) is the inhibitor or depressor, the direct antagonist of the parasympathetic. Stimulation or activity of this system leads to relaxation and loss of tone and to checking of secretion. Royle denies that relaxation is an essential factor of its activity but believes that excessive action of the sympathetic nervous system fixes any posture that is imposed, producing a fixation of plastic tone. He proved this idea by the operations of lumbar sympathetic ganglionectomy and ramisectomy in megacolon and decompensated redundant colons to relieve constipation when the bowel loops were fixed in form. Practically, pure cases of overactivity are never found of one system. The work of Bockus and his associates [2] shows that a general imbalance exists in the autonomic nervous system with varying degrees of overactivity

1. Larimore, J. W.: The Human Large Intestine in the New-Born and in the Adult, Ann. Clin. Med. **5**: 439 (Nov.) 1926.

2. Bockus, H. L.; Bank, J., and Wilkinson, S. A.: Neurogenic Mucous Colitis, Am. J. M. Sc. **176**: 813 (Dec.) 1928.

of both systems, with that of the parasympathetic (vagus) more pronounced.

THE SPASTIC, IRRITABLE COLON AND MUCOUS COLITIS

As somewhat of a contrast, the hypertonic colopathies, which include the spastic colon, the irritable colon and mucous colitis as different phases of the same functional disorder, present not only the local bowel derangement but clearly a more apparent nervous and psychic disturbance. A preponderance of evidence indicates that the syndrome of the spastic, irritable colon is a visceral neurosis (in some respects akin to asthma) and exists only in persons with unstable or poorly coordinated nervous systems.

Fig. 1.—Variations in form of colon; essential tendency to redundancy and atonia. *A*, normal colon; *B*, redundant colon; *C*, atonic loop, redundant colon; *D*, megacolon; *E*, low descent of cecum; *F*, low descent of cecum after evacuation; *G*, irritable colon relaxed by enema; *H*, after evacuation.

As a group, intelligent and analytical, and excessively hypersensitive, they seem to have adopted a phobia of some disease (generally cancer) and an obsession, constipation.

It matters not that at the time advice is sought there may be many liquid and mucous stools a day, with great pain; this is usually considered but an episode. The thing that matters is the constipation that always comes, and the patient's fear of its results. As Dr. Lewellys F. Barker [3] has so aptly summarized it, that "form of habitual constipation in which there is persistent spasm of the colon (hyperkinetic-dyskinetic constipation), often associated with paroxysms in which larger or smaller quantities of mucus are passed from the bowel . . . is most obstinate and more and more difficult satisfactorily to treat, especially when it occurs in patients of outspoken hypervagotonic constitution."

Normal colon function includes fluid and salt absorption, a favorable bacterial digestive activity, and certain regulatory motor phenomena. These consist of the pendulum movements that mix its contents, peristaltic waves that send these onward to the distal bowel, and important antiperistaltic contractions that result in the retention of the contents in the cecum and ascending colon. Nature thus provides for a retention or favorable stagnation in the cecum, which makes possible bacterial digestion, absorption of fluids and soluble products, and the proper concentration of the excreta, insuring a formed paste in the distal bowel.

When the fluid contents of the cecum are projected rapidly to the distal colon, all the ills of intestinal indigestion result: irritation, fermentation, impaired absorption of intestinal gases, colonic spasm and pain, and systemic toxic effects. On the other hand, when the contents of the proximal colon are too long held up by dysfunction of the peristaltic and other motor activities, the dry inspissated residue produces a similar result, though with different characteristics. In either of these states a heightened irritability of the neural and muscular mechanisms of the colon exists, leading to spasms, an incoordination of the colonic contractions and often to hyperactivity and perverted secretion of mucous glands.

In functional colon disturbance are found (*a*) spasm most pronounced in the descending and sigmoid colon, (*b*) peristalsis and antiperistalsis greatly increased in the cecum and adjacent bowel with prolonged stasis and (*c*) excessive mucous secretion. An underlying neurosis is the essential factor that produces this type of habitual constipation and irritable colon. However, not all neurotic persons have irritable colons, and it would be a grave error to consider the neurasthenia as the only provocative incentive of the disturbance. Of immediate importance may be states of debilitation and exhaustion from many causes, such as various infections, a thyrotoxic episode, inroads of child bearing, abuse of the intestinal tract with laxatives and enemas, and certain intoxicants, such as poisoning from lead and from tobacco. Undoubtedly, all these conditions, plus emotional crises and the wear and tear of life, may bring in extraneous influences enough to set off functional disturbances that are held in abeyance. Intestinal neuroses diminish as one descends the social scale.

As a class, individuals with functional colon disorders are more or less unstable with an apparent imbalance of autonomic control of many involuntary functions, being easily excited, worrying, anxious, below par physically and frequently hyperanalytic and introspective. The intestinal complaint may be but a local manifestation of a general spasmophilic tendency. Outspoken vagotonia is frequently apparent. Migraine is common and asthma in the family history is not infrequent, as also are other allergic reactions. Spareness, undernutrition, visceroptosis, active mentality, and

3. Barker, L. F.: On the Management of the Spastic Colon and Mucous Colopathy, Especially in Hypervagotonic Persons, Am. J. M. Sc. **178**: 606 (Nov.) 1929.

a too frequent impulse to "go on their nerve" are outstanding characteristics.

Wide pupils, erythemas, sweatings, irritable heart, variable blood pressure, fatigability and affective states abound. In many patients the evident and distinctive features of nervous instability and hypertonia are not casually apparent. Just as in migraine, the individual may seem most phlegmatic, reasonable and composed, and it is only when under strain, physically or mentally, or both, that the nervous instability can be recognized.

About 75 per cent of these disorders occur in women. While the age average is about 35 to 40 years, the condition may occur in the second to the fifth decade. Constipation and abdominal discomfort, often amounting to the severest pain, simulating disease in other neighborhood organs, are the leading complaints.

An abdominal unrest is evident, with sensations of rumbling, gurgling and bowel tremor, terrifying to the patient and greatly accentuated when, in the more irritable types, quantities of mucus are passed. The discomfort may be described as a tight feeling, or pressure sense, like a ball or lump or stoppage. This feeling may be diffuse but is more generally located in the lower part of the abdomen, especially on the left, with tenderness and soreness about the cecum.

While a gnawing sensation is frequent, the pain is usually a dull continuous ache, which may be general or localized. At intervals it may be spasmodic, but it is not rhythmic and not of the relentless immobilizing character of an acute inflammatory condition. To some it is agonizingly severe, localized accurately over the particular part of the colon in spasm, and even requiring relief by opiates. Ryle [4] speaks of it as suggestive of major colic, localized or diffuse, lasting from hours to days, of variable frequency and occurring generally two or three hours after food has been taken. During the day it seems to incapacitate and depress the victim out of all proportion to the actual physical manifestations, but rarely disturbs sleep. Heat and rest give relief, as also will a bowel movement, generally.

The constipation may be mild but usually is obstinate and at periods may be excessive. With an increase of nervous irritability, periods of diarrhea ensue, and it is not unusual to have a regular interchange of small, dry, constipated stools for several days, followed by a shorter period of violent diarrhea with watery stools and mucus in great sheets and strings. The steady dull pain appears in the period of constipation, with severe paroxysms in the diarrheic, especially in conjunction with excessive quantities of mucus. The stools are difficult to pass and are always unsatisfactory to the patient, but they are negative for pus and parasites and usually for blood.

There is an almost invariable use of cathartics and enemas, partly because of a great fear that an organic obstruction or block exists somewhere in the intestinal tract, or of an unreasonable anxiety in reference to the constipation and systemic poisoning. There are chronic fatigue, chronic indigestion and a coated tongue.

Subjective flatulence and gas, with nervous eructations, may be present but does not cause objective distention, except in the less frequent cases with fermentative intestinal floras.

On examining the abdomen, the keen observer will detect the excessive degree of complaint and the hysteria-like attitude as being unwarranted in comparison with the objective manifestations and realize that he is dealing with a barometic belly. Such an abdomen is markedly hypersensitive and flinches almost as it is touched; the lightest pressure on the skin is almost as distressing as deeper palpation. The ropy or cordlike sigmoid may or may not be felt. More characteristic, but present in only a moderate percentage of cases, is the abnormal cecum, either firm, prominent and resistant or lax, boggy and baglike, distended with material, gas and fluid, sensitive and tender, lying low in the inguinal region.

Elmer Eggleston [5] estimates that from 20 to 25 per cent of these patients have had their appendixes removed (so-called chronic appendix) and in 5 per cent the gallbladders have been taken out without any improvement. The wise surgeon now knows that it is best to stay out of the "functional abdomen."

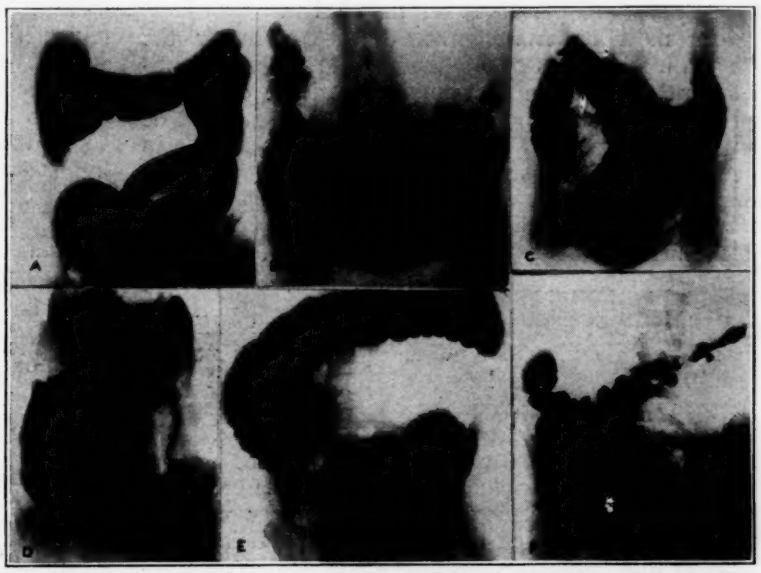

Fig. 2.—Differences in contractility of colon; essential tendency to short or normal lengths and hypertonia. *A*, redundant colon dilated and relaxed by enema; *B*, general spasticity; *C*, irritation type of segmentation, segmental spasm; *D*, irritable colon, feather sign; *E*, spastic sigmoid, dilated cecum; *F*, spastic colon, string sign.

DIAGNOSIS

The diagnosis is made primarily when a history and physical examination with the essential characteristics are secured. It is further sustained by a study of the stools, rectal and sigmoidoscopic examination and roentgen visualization of the gastro-intestinal tract.

The stools show great variation in form and shape, ranging from normally formed to mushy or watery, or with alternating periods of small, dry, marble-like masses, followed by diarrheic looseness and great quantities of mucus. They are essentially negative on microscopic examination, although occasionally a few blood cells can be noted.

The sigmoidoscopic examination is primarily important in ruling out early ulcerative colitis, amebic dysentery, rectal ulcer and neoplasm of the rectum and lower sigmoid. This examination should always be made.

4. Ryle, J. A.: The Study of Symptoms, Lancet **1**: 737 (April) 1931; Chronic Spasmodic Affections of the Colon and the Diseases Which They Simulate, ibid. **2**: 1115 (Dec. 1) 1928.

5. Eggleston, E. L.: Colitis—The Spastic Type, J. A. M. A. **91**: 2049 (Dec. 29) 1928; Common Disorders of the Colon Observed in the Treatment of the Chronic Invalid, New Orleans M. & S. J. **81**: 686 (April) 1929.

Spasm, irritability, moist normal looking mucous membranes, with perhaps a little injection and a rectum usually empty but containing mucus in varying amounts and appearance, are characteristic. The membrane everywhere is intact and normal appearing to the eye.

Visualization by the roentgen ray of different portions of the gastro-intestinal tract in functional disturbances of the colon, like the sigmoidoscopic examinations, is chiefly of value in demonstrating or ruling out pathologic conditions not related to form or function.

If none such is found, then the bowel form—namely, the length of the colon and degree of redundancy, amount of decompensation, and loss of tone in loops, presence of diverticula and position of the flexures—is next in importance. Finally, the degree of irritability present at that time may be demonstrated. This may vary at different periods from the normal form and tone previously shown to varying degrees of general spasticity, segmental irritation phenomena, hurried or delayed emptying, a spastic sigmoid with a large dilated cecum, a feathery descending colon simulating the appearance of the small bowel, and occasionally (10 per cent) the string sign.

The most important procedure is to follow the barium meal down through the tract to judge approximately the disturbance of motility and the degree of irritability, stasis and fermentative processes. The normal bowel is usually only partially empty, while in the irritable bowel only a trace of barium is left in the colon. The barium enema is important, but since it relaxes spasm it may mislead the observer entirely as to the motor function of the bowel.

PROGNOSIS AND TREATMENT

Patience and education finally bring these sufferers to relative stability and ultimately to almost normal health. The road is long and the way beset with relapses that develop with the ills that befall mankind and with unfavorable environmental conditions. The conquering of fear and other emotions, and the acquisition by them of a convincing insight into the nature of their sickness—psychologic control, in other words—is the great foundation for cure. The physician must develop this understanding and teach proper management for the overtonic colon, just as he must restore tone and compensation to the dilated and stretched loops and segments of the redundant and other atonic forms.

Aside from these considerations, more specific treatment of the condition is included in the following suggestions:

A. In the abnormal bowel forms with redundancy and atonic decompensated loops, immediate relief of fecal retention is indicated. Treatment should include small flushings or repeated colon siphonage, followed by oil retention enemas and oil by mouth; the use of a peristaltic excitant, such as ampoules of pitressin, and of thyroid extract (especially when the basal metabolism is lowered), and, finally, the avoidance of all belladonna preparations to aid and not deter the craniosacral system.

The diet should be bland but contain much soft pulp and vitamins, especially vitamin B.

Only in the more resistant and extreme cases of obstinate, persistent constipation should sympathetic ganglionectomy and ramisectomy be resorted to. Many cases of megacolon may require such surgical aid. In all other respects the treatment is essentially that noted under B.

B. In the hypertonic and more irritable states, I have found the following procedures of the most value in the management of the colon:

1. Overcoming physical exhaustion. Bed rest and convalescent care.

2. Psychologic directions and readjustment; securing a favorable environment and outlook.

3. Sedative aids adjusted to needs of the individual; mild hypnotics; antispasmodics, such as belladonna, novatropine, phenobarbital, bromides and amytal. Empirical use of calcium salt in large amounts, with perhaps parathyroid or viosterol. Usually avoidance of thyroid and pituitary extracts.

4. Control of stools: First, there must be the elimination of all laxatives and irrigations. Then lubrication is instituted by mouth and rectal oil retention as needed, and nonirritating mechanical stimulants are started in the spastic stage, such as soaked soft agar or strained psyllium. Variation of the diet, according to the appearance of the stools, must be taught.

5. A bland and nonirritating diet. No roughage is allowed. Bran and other nonsoluble irritants are forbidden. The diet should contain a list of foods to be taken if diarrhea develops. As the stools become formed and then hard and dry, addition of puréed vegetables and fruits is indicated. Selected vitamins that do not induce laxative reaction should be given. There must be the accepted balance in protein, carbohydrate and fat intake, with emphasis on proper nutrition. Ultimately, it should be made as general as the tolerance of the bowel will permit. Some allergic adjustments may need to be made.

6. Symptomatically such aids as are necessary in controlling dyspepsia must be given consideration, such as colloidal kaolin for bowel fermentation and gas, or acidophilus cultures; use of dilute hydrochloric acid or alkalis; digestive ferments, especially pancreatin, and possibly yeast.

SUMMARY

A critical analysis of chronic disorders of the bowel leads to a recognition of inflammatory states with lesions of the mucous membrane, properly called colitis, on the one hand, and, on the other, of disturbances related to the form and function of the bowel.

These disturbances, characterized by constipation and irregular diarrhea, seem fundamentally to depend on bowel form, motor function and the constitutional make up of the individual.

The limited benefit resulting from correction of local abdominal and rectal lesions, intestinal flora and allergic intolerances must be admitted. In studying these conditions the bowel form (length, loopings, decompensation) as well as degrees of hypertonia and atonia must be considered. Knowledge of the rôle of the autonomic nervous system, as exemplified by the varying control of the craniosacral and sympathetic divisions, is essential.

There are features of the clinical history and examination characteristic of functional colon disorders; and the diagnosis is made certain by the relatively negative examinations of stool analysis, roentgen studies and sigmoidoscopic examination.

Treatment is essentially soothing and sedative; reconstructive both psychologically and physically. It must include a regimen of colon management, which has been outlined in detail.

384 Post Street.

ABSTRACT OF DISCUSSION

DR. LEWELLYS F. BARKER, Baltimore: Dr. Kruse has emphasized the importance for therapy of rather sharply separating the disturbances of function of the large bowel that are associated with abnormal colonic forms, such as redundance and megacolon, from those that in the absence of such abnormal forms depend mainly on unbalanced autonomic innervation, as in the irritable colon, the hypertonic or spastic colon, and the so-called mucous colopathy. In the latter group of cases, a thorough general diagnostic study is important. One should not be content with a diagnosis of the disturbance of the functions of the intestine alone but should push the study far enough to reveal all important deviations from normal structure and function in the whole organism, making a corresponding multidimensional diagnosis before planning the therapy. A study of this sort inspires the patient with confidence that his physician has made sure of the conditions that actually exist and that therefore nothing important is likely to be overlooked in treatment. Disturbances of the general state of nutrition, often with marked emaciation, are frequent accompaniments, as are functional neuroses and affective disorders of cyclothymic tendency. Adequate treatment of these when found may be the best measure also for overcoming the colonic disturbances. That organic disease of any of the abdominal or pelvic organs should be discovered if present and duly evaluated goes without saying. Surgery will sometimes be indicated, of course, but far less often than many general practitioners have thought. Unnecessary surgery does more harm than good, prolongs the illness, and, by its failure to cure, increases the discouragement of the patient. Dr. Kruse has outlined the fruitful medical measures, including general upbuilding, a caloric intake of bland diet suited to the caloric and metabolic needs, adequate physical and mental rest, sedatives for the nervous system, antispasmodics, especially methatropine, for the hyperkinetic colon, and careful kidney guidance with repeated reassurance during supervision until health is restored.

DR. WALTER L. PALMER, Chicago: The first problem in dealing with what I choose to call "bowel distress" is that of the exclusion of organic disease of the bowel. The term "colitis" should be reserved, as Bargen and others insist, for organic inflammatory disease of the colon. The diagnosis of amebic dysentery, nonspecific ulcerative colitis or carcinoma is ordinarily not difficult if one follows the usual procedure of a careful history, complete physical examination, endoscopic examination of the rectum and lower sigmoid, careful search in the stool for pus, blood and parasites, and finally roentgen examination. The second problem is that of excluding organic disease elsewhere in the body. I have in mind particularly early pulmonary tuberculosis and thyrotoxicosis, diseases that frequently manifest themselves by means of abdominal distress and for which the physician must always be on the watch. Cholelithiasis, peptic ulcer, carcinoma and other intra-abdominal diseases frequently simulate "bowel distress" and are easily overlooked. After organic disease has been excluded, there still remain, as the author has pointed out, the so-called functional cases of abdominal distress with chronic diarrhea or constipation. Much has been written of redundances and loopings, of mobile and immobile cecums, of high lying cecums and low lying cecums, of autonomic imbalance, of visceroptosis, and so on. It is necessary to maintain a critical and somewhat skeptical attitude toward all these innovations. The important consideration is not where the colon lies or how it twists but rather how it functions. This problem is relatively simple, for colonic function depends on the treatment the colon receives. Continued catharsis, repeated enemas and injudicious dietary habits result in colonic irritability, which usually subsides promptly when a bland diet is instituted and the chemical and mechanical insults to the colon are discontinued. In many cases, however, the disturbance cannot be related to dietetic or cathartic habits, and a diagnosis of visceral neurosis is made. This is the group of patients to which the author's phrase "the barometric abdomen" is particularly applicable. The abdomen is the barometer of the individual and attention should be directed not toward the bowel alone but rather toward the total personality of the patient. Every one is familiar with nervous diarrhea as an acute episode associated with some emotional disturbance, but many fail to appreciate the frequency with which chronic motility derangements of the intestine are merely the organic manifestations or reflections of chronic emotional stress. In general, the colonic patient taxes to an unusual degree both the diagnostic acumen and the therapeutic skill of the physician.

DR. E. L. EGGLESTON, Battle Creek, Mich.: Dr. Kruse has called attention to a particularly severe type in which the diagnosis is easily made. On the contrary, a patient with mild involvement may suffer from symptoms only when under emotional stress, but if the cause is not relieved the trouble becomes more persistent and finally chronic. While constipation is the rule, an occasional loose movement may occur, after which the patient may complain of greater discomfort. The trouble is not primarily intestinal in origin. A nervous instability resulting from emotional stress, an anxiety state, is primarily the cause of the colon dysfunction. The autonomic nervous mechanism is not affected by the will but is profoundly disturbed by the emotions. This disturbance may not be limited to the colon but may affect the entire gastro-intestinal tract. Most of these cases when observed under the x-rays exhibit a rapid emptying stomach and small intestine, and the barium may reach the pelvic colon in two or three hours. Here the intestinal contents encounter an obstruction due to a more or less tonic spasm of the pelvic colon, so that what appears to be a rapid emptying of the colon develops into a very obstinate constipation. It is unfortunate that the causes of the instability of the autonomic nervous mechanism are not more thoroughly understood. Emotional strain, anxiety and insomnia are potent factors in causing this disturbance. That it is not due to dietetic indiscretions or to infections is apparently proved by the Negro. While his dietetic habits are notoriously bad and his use of liquor and tobacco is excessive, he is definitely susceptible to different types of infection. He apparently has not yet acquired the ability to worry and so is spared these troubles which are so distressing to his white brother. Not only is he free from the spastic colon, but peptic ulcer is rare among his race. I fear that Dr. Kruse may have left the impression that the hypertonic colon obtains in the physically unfit only. This, I regret to say, is not the case. Its presence is rather a mark of an advanced civilization, of a highly organized nervous mechanism. I am of the opinion that a sympatheticotonia obtains more commonly with those individuals who are physically unfit from birth. There are those who consider the hypertonic colon an allergic reaction because of its similarity to asthma. Until more is known about the causes of allergy, I think it best to consider it a vagotonic manifestation, and I am in accord with Dr. Kruse in emphasizing that the real cure comes as a result of education rather than from some method that may temporarily relieve the constipation.

DR. WILLIAM LINTZ, Brooklyn: I find that most colopathies are in reality of allergic origin. The symptoms differ in no wise from those described. Of all the manifestations of allergy I find that the intestinal form is by far the most frequent. Bacteria and their toxins, foods and their split products, the most frequent of all, allergens, are found there in greatest amount. Histamine, with which one can reproduce all the various manifestations of anaphylaxis, is normally found there The history is the most important point in the diagnosis and treatment of these patients. There are present other allergic manifestations in the patient, relatives and offspring. The skin testing in allergy depends on this principle. Allergic skin manifestation is so frequent in this intestinal form that it should be considered a symptom of the syndrome. The family history of allergy in relatives and offspring I found in 61 per cent of my series. Allergic intestines differ from all others in that a certain article of diet will give rise to moderate or violent symptoms. "Eggs gave me severe cramps and diarrhea." Milk or oatmeal act as physics. The odor of cooking chicken, lamb and fish produced bronchial asthma, and soups from these foods produced abdominal pain, cramps and diarrhea without asthma in the same patient. The bacterial flora and their products may act as a sensitizing focus on the allergic bowel. In one patient not only the colitis but the asthma as well vanished after the eradication of infected foci. The allergens producing intestinal manifestations are legion. A patient had constipation for days every time he took oatmeal. It took four different trials to convince another patient that liquid

petrolatum was the cause of his constipation. Surely, what is one man's meat is another one's poison. Quite frequently these patients turn tables to their advantage when they discover foods that have a mild hypersensitive effect on their allergic bowel, as when they use milk and numerous other foods as a laxative. A strong point in the history is that the elimination of the offending food eliminates the bowel symptoms and its restoration provokes it. When the vagus dominates, the patient is much more sensitive to his allergens. Allergic individuals are influenced psychically through this route. Not only the abdominal symptoms but the other neurologic and allergic manifestations disappear with it. Skin tests are correct in only 50 per cent of cases. This allergic bowel should be the last diagnosis. Every other lesion should be excluded first. The treatment should be the determination and exclusion of allergens or desensitization when this is impossible.

DR. FRED H. KRUSE, San Francisco: There are two issues that I will consider further: One is the matter of surgical treatment, its necessity and what one may hope to gain from it. Dr. Barker has emphasized the importance of a careful diagnostic survey as a preliminary measure in the care of patients suffering from functional colon disorders. Suppose in such a case stones are found in the gallbladder or a fibroid tumor in the pelvis. What is to be done about it? I have seen patients with irritable colon and quiescent pathologic conditions of this sort operated on without any resultant reflex benefit or improvement. In the long run, the patients have only a disturbing episode with an exacerbation of the chronic colon disorder to remember, and a continuance of the original disturbance. I believe that the course one is going to take should be determined by the nature of the physiologic disturbance present. When there are indications of apparent gallbladder dyspepsia, or evidence of trouble from a fibroid uterus, these should be removed. But they should not be removed with the idea that the patient will get a great deal of help for the irritated colon, especially if in the history and examination it is found that the patient has the earmarks of the constitutional and psychic make-up described here. I have been disappointed when such operations have been carried out. Ten years ago I did that regularly. If one operates on such patients for something that isn't really causing the bowel disorder, they are apt to spend three or four or six months in bed and are made much worse. Secondly, in reference to allergy, I agree with Dr. Lintz that there are many people who have allergic bowel reactions, exacerbating at least a chronic colon disorder. Such conclusions have been forced on me in several cases. All these possibilities must be kept in mind. Food allergy must be thought of. But, by and large, if the syndrome I have described is evident, both in the physical make-up and in the nervous and physiologic responses of an individual, sad experience has taught the futility of relying too heavily on the aid of surgery or allergy, be it by the desensitization or the food elimination method. I have tried them all.

Inspiration and Medical Schools.—The last function of a medical school or faculty that need be mentioned here is that of inspiration. It must be a poor school or university which cannot supply this, either through its general atmosphere or through the personality of one or more of its teachers. It is a real thing, and a necessary thing for the medical practitioner. Without it the student's acquirements will be imperfect, and his work, both during his studentship and thereafter through his professional career, a burden, or at least a source of infinitely less satisfaction than it might otherwise have been. In the words of Littré, "La puissance de l'éducation consiste à augmenter le nombre des motifs dans l'ésprit de l'individu." If the student is not put in the way of acquiring, or of developing, some width of culture, a zest for knowledge, a love for his work, a real sympathy with human suffering and trouble, a profound respect for confidence reposed in him, an appreciation of nobility of character and of the dignity and peculiar requirements of professional life, to that extent will the contribution made by the medical school to his medical education have failed of its complete purpose, and to that extent will he pass out from it a liability rather than an asset to his profession and to the community.—Brackenbury, Sir Henry: The Training of the Medical Practitioner, *Brit M. J.* **2**:381 (Sept. 1) 1934.

Clinical Notes, Suggestions and New Instruments

WHOOPING COUGH CURED BY MUMPS

REPORT OF TWO CASES

EDMUND W. KLINEFELTER, M.D., YORK, PA.

Feb. 28, 1934, a mother of three children called me on the telephone, stating that her three children had whooping cough and were vomiting after each coughing paroxysm. I went to see the children on the same day and confirmed the diagnosis made by the mother. Each of the three children, a boy of 14 months, a girl of 3 years and a boy of 5 years, showed typical attacks of coughing followed by vomiting when I made an effort to examine their throats.

The oldest boy had been showing the typical paroxysms for the past week, the other two for only the past two days. For the past two days the paroxysms were occurring from three to four times every hour. The mother told me that either one or the other of the children would start off on a coughing spell and then the other two would join in. There was no elevation of temperature. Under antipyrine, belladonna and amytal medication a prompt diminution occurred in the number and severity of the paroxysms in the younger children. The 5 year old, however, was made worse by the antipyrine, belladonna and amytal. Therefore, March 3, I stopped giving this medication to the 5 year old and began the rectal administration of ether in oil. The ether in oil produced no improvement and was discontinued on March 6.

March 6, the mother called me early in the morning stating that the 5 year old had a swelling on the right side of his face about the size of a grapefruit. Examination showed the boy to have a typical case of mumps with the high temperature of 104 F. by mouth. Inspection of the throat at this time did not elicit a coughing paroxysm. From March 6 on there were no more paroxysms. Nourishment was taken without coughing or vomiting. At times there was a slight cough but no typical whooping cough. By March 12 the child was perfectly well with a normal temperature and no evidences of whooping cough or mumps. From March 6, no medication was administered. Pink and white colored blank tablets were given as placebos.

March 9 the 3 year old child developed a swelling on the right side of her face. Examination showed that this child also had a typical case of mumps. The temperature by rectum was 101 F. Inspection of the throat at this time did not elicit a paroxysm. With the onset of the mumps there was likewise in this case an abrupt cessation of the coughing paroxysms. By March 10 the temperature was normal and the antipyrine, belladonna and amytal medication was stopped. By March 17 the mumps had completely disappeared and the child was perfectly well. Neither during nor after the attack of mumps were there any whooping cough paroxysms.

Up until the middle of May, the 14 months old child suffered from typical whooping cough paroxysms. From May 15 on there was gradual improvement. The intermittent administration of antipyrine, belladonna and amytal served nicely to control the cough in this child.

Numerous cases are reported in medical literature showing that at times one disease may exert a favorable or curative influence on another disease. It has been reported that whooping cough can be checked during the eruptive stage of chickenpox. However, after the disappearance of the eruption the paroxysms again become severe.[1] Apparently vaccinia at times exerts a favorable influence on whooping cough.[2] Tuscherer[3] observed two cases of whooping cough that were suddenly checked by an attack of measles. A review of the literature has shown no report of a case of whooping cough benefited or cured by an attack of mumps.

50 South Beaver Street.

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Special Article

THE TREATMENT OF CHRONIC BRIGHT'S DISEASE

CLINICAL LECTURE AT CLEVELAND SESSION

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The term "chronic Bright's disease" includes essentially three diseases: chronic glomerulonephritis, chronic vascular nephritis and chronic nephrosis. For this discussion on treatment, it is permissible to consider chronic glomerulonephritis and chronic vascular nephritis as one disease—chronic nephritis with hypertension.

There is nothing new or startling in the treatment of this nephritis. The therapy of the condition is more or less standardized in all textbooks, and until the late stages it is quite effective. In the uremic stage, treatment is at best palliative and eventually, of course, ineffectual. For such a gathering as this no detailed discussion of the standard treatment is, of course, necessary. It should suffice merely to indicate general principles and then to stress certain features that seem to me to be especially important and worthy of your attention.

The commonly accepted treatment aims at three primary objects:

1. First and foremost is the maintenance of the health of the whole body.

2. Secondly, it seeks the elimination of all toxins that in passage through the kidneys may increase the progress of the renal lesion. This means the eradication of all true sources of infection. It does not, however, mean ruthless surgery on such structures as the teeth, tonsils and sinuses that are mere objects of suspicion. It means also the avoidance of intercurrent infections as far as possible and prompt and efficient care of them when they do occur. It means proper care of the bowels to eliminate poisons from that source. Finally, it means a diet constructed to avoid undue strain on the kidneys by all products of excretion.

3. Lastly, signs must be recognized and cared for and the patient given relief for his symptoms as they arise.

The most important form of treatment, without doubt, is a diet that aims at a proper balance between food intake, the ability of the kidneys to excrete end products, and the general needs of the body.

Because of the enormous reserve power of the kidney, no great dietetic restriction is necessary or desirable in the early stages of this disease. Nothing more than simple instructions to avoid any excessive intake of protein, salt and fluid seems indicated. Meat or fish once a day, no salt added to the food after it comes to the table, and fluids limited to 4 pints is sufficiently restrictive.

As the disease advances and renal function falls, one is forced to make greater and greater restrictions. Much harm, however, can come from excessive protein reduction. Occasionally conditions demand a modified Karrell diet or a very low protein ration. These diets should be prescribed only with a full understanding of one's aims and the dangers involved. They should be used for as short a time as possible, after which there should be a prompt return to a basic dietetic regimen. For the last a good general rule to follow is this: As far as one possibly can, one should try at all times to give the patient a mixed diet of sufficient calories, with about 1 Gm. of protein per kilogram of body weight. The salt intake should be limited to that which is in the food when it comes to the table (from 3 to 5 Gm.). The fluid intake, at first restricted to 4 pints or less, may be increased gradually and carefully, as renal insufficiency becomes greater, up to 6 pints a day. This increase is to take advantage of the polyuria, which allows an excretion in dilute concentration of substances that cannot be eliminated in more concentrated form.

When renal decompensation has become great and definite signs of uremia appear, therapy is often difficult and unsatisfactory. It is necessary at times to choose between several evils. If one institutes too rigorous protein restriction to decrease the kidney load, the patient's own tissues may break down and increase the toxemia. If excessive fluid is administered, the heart may be embarrassed. If the patient is vomiting, much chloride may be lost and produce symptoms. Incidentally the blood chloride is often low in the late stages even without vomiting. Increased intake of salt by mouth or by clyses may be required.

In the vomiting patient the problem may be particularly difficult. Experience has taught me that the best solution for this problem is for the doctor to confine his attention to the administration of an adequate amount of fluid in the form of salt solution and dextrose given by vein, under the skin or by rectum. The feeding of the patient should be turned over to some tactful nurse or dietitian, who will often succeed, when the doctor cannot. No restriction whatever should be placed on what she may feed the patient, although the protein-sparing carbohydrates should be encouraged. Every effort should be made to satisfy the patient's demands, no matter how queer they may seem. It is a well known fact that a patient will retain something he craves and reject foods that have no appeal. If he asks for beer and a ham sandwich, give them to him; he may retain them. Once the vomiting has ceased, the patient should be put back on his former diet.

The rest of the treatment of chronic hypertensive nephritis is purely symptomatic. No therapy for the anemia is entirely satisfactory. Iron in the form of pills of ferrous carbonate (Blaud's pills) has been used from early days without, however, much success. This lack of success may well be due to interference with absorption of this substance. Perhaps if the drug were given in 10 grain (0.65 Gm.) doses before meals greater success would be obtained. Transfusions, though of some value late in the disease, have merely a transitory effect.

Many of the cerebral symptoms that occur in uremia are said to be due to the absorption from the large bowel of toxic phenols and cresols, which seem to get into the circulation with great ease in these late stages. Cleansing the bowel by frequent saline catharsis and enemas seems to constitute the only remedies. These, by exhaustion of the patient, may introduce other difficulties. Sedatives, of course, are necessary. Of these phenobarbital by mouth or by injection, and chloral by rectum, are the most generally useful. For the con-

From the Medical Clinic of the Peter Bent Brigham Hospital. Read before the General Scientific Meeting at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 12, 1934.

vulsive seizures, threatened or actual, magnesium sulphate (intramuscularly or intravenously), morphine sulphate, intravenous dextrose and possibly lumbar puncture are to be considered. For the extremely uncomfortable itch, nothing is as effective as sponging with vinegar or weak acetic acid. It is to be borne in mind that all drugs excreted by way of the kidney are retained longer when renal insufficiency is marked. Their effect is therefore more prolonged and more pronounced.

I will now consider certain parts of the problem that, to my way of thinking, require special attention. Ever since Bright's name was first given to this disease, many doctors have regarded nephritis as a disease of the kidneys alone. Intelligent treatment demands above all else a recognition of the fact that this is decidedly not so. In fact, there is no form of nephritis, acute or chronic, in which the disease is confined to the kidneys. Intelligent treatment demands further the realization that in many a patient the disturbances of other organs are far more serious and require far more attention than do the kidneys. The thoughtless physician who focuses his "oil immersion" on the kidneys alone may be rudely jolted by the sudden death of his patient from a heart attack or a cerebral hemorrhage. In his lack of knowledge he may attribute these to uremia. This is not merely incorrect but bad medicine. By recognition of what is going on and by the institution of appropriate therapy it is often possible to avoid such accidents. In the Peter Bent Brigham Hospital more than half our patients with chronic Bright's disease die from a nonrenal cause, often long before the kidneys have become completely insufficient. It is well then in every case of this disease to bear in mind at all times the condition of the heart, the cerebral vessels and the height of the blood pressure.

Often a remedy that might be of value for the kidneys is distinctly harmful to the heart. I have seen several patients develop pulmonary edema from too enthusiastic administration of fluids or from sweat baths, which, fortunately, have now been largerly discarded. Even excessive purgation may exhaust the patient and bring about cardiac decompensation.

Another point that needs stressing is the danger of overtreatment. Great harm can come from too great dietetic restriction. In the past, physicians were undoubtedly all guilty in this respect. Patients were kept on a very low protein ration for long periods on the theory that the work of the kidneys was being spared. The rest of the body was neglected. Sister Mary Victor of the Mayo Clinic has made it plain that any diet containing less than 40 Gm. of protein cannot supply an adequate mineral content. Diets of 40 to 50 Gm. contain insufficient phosphorus and iron. Only diets containing 60 Gm. of protein or over are entirely adequate. This, of course, does not mean that one should never prescribe low protein diets. Such a diet should, however, be used only for a short period and with full knowledge of the risks involved.

The treatment of chronic lipoid nephrosis is not so thoroughly standardized or satisfactory as that of chronic hypertensive nephritis. The results of therapy are exasperatingly variable. At times a brilliant result is achieved. More often, however, the brilliancy of the therapy is only apparent and the results have little to do with the form of treatment used. Spontaneous diuresis is almost the rule. The utmost conservatism, therefore, must be maintained in the interpretation of any therapy. Let me illustrate:

On one occasion during ward rounds I suggested the intravenous injection of hypertonic dextrose for a markedly edematous patient and on my next visit was greatly pleased to note a doubling of the previous daily output of urine. Imagine my embarrassment when, after expressing great delight at the success of my suggestion, I was informed by the stammering house officer that he had forgotten to give it.

I recall vividly another patient on whom every known form of therapy had been tried over a period of three to four months without success. Because of some apparent infection of the teeth, the hospital dentist was consulted, and he advised the extraction of two teeth. The consultation occurred on Monday. He returned on the following Thursday and extracted the teeth. A diuresis was instituted and the patient in the course of the next few weeks became entirely edema free. From the point of view of the dentist and the interpretation of therapeutic results it was most unfortunate that his consultation occurred on Monday and the extraction of teeth on Thursday, for the diuresis started on Tuesday, the day after he first saw the patient. I am sure any one would have been justified in claiming "cause and effect" if the teeth had been removed on the day the patient was first seen by the dentist.

Finally, all treatment may be absolutely ineffective. Even treatment that has previously been known to produce a diuresis in a given case may fail to obtain a result at a later date.

The "sheet anchor" in the treatment of lipoid nephrosis is undoubtedly the replacement of lost blood proteins by the high protein diet originally devised by Epstein. It no longer seems necessary to use the low fat intake originally suggested by him. This serves no useful purpose and apparently makes for greater difficulty in feeding the patient. For some time it has been our program to give a mixed diet containing adequate calories and protein ration of 100 to 150 Gm. daily for a period of from two to three weeks. This is usually enough to give the body a chance to replenish, to some degree at least, the depleted blood proteins. At the end of such a period the high intake has usually begun to become monotonous or difficult for the average patient. It is then wise to drop back to about 1 Gm. per kilogram of body weight, plus the average amount of albumin lost daily through the kidneys. The diet should, of course, be salt poor and the fluid intake limited to 1,000 cc. or less. In some patients with very low output (from 300 to 500 cc.) Volhard has advised an intake each day equivalent to the urinary excretion of the previous day.

Unfortunately it is only on a rare occasion that this high protein ration alone is sufficient to produce a complete clearing of the edema, and recourse must be made to other forms of therapy. Epstein and others have felt that the administration of thyroid extract adds to the value of the high protein regimen. My experience with this drug has been very disappointing.

Next to the high protein diet, the most successful therapy in my hands has been the administration of the mercurial diuretic salyrgan, given in doses of from 1 to 2 cc., intravenously or intramuscularly, every three or four days. It seems to work best in the presence of an acidosis, produced by the oral administration of from 8 to 12 Gm. of ammonium chloride each day. Other diuretics and other drugs producing acidosis have not

been as effective. Salyrgan is open to the objection that it must be injected by needle and is distinctly irritating. It may produce thrombosis of the veins, and if any of the solution gets into the subcutaneous tissues a painful slough occurs. The intramuscular route is perhaps more commonly used, but the results are not quite as good as when the drug is given intravenously.

Salyrgan sometimes fails, and for one reason or another its use may not be possible. One must then turn to other methods, most of which are, by and large, less effective. Urea by mouth, in daily doses of from 20 to 100 Gm., is probably the next best drug. Calcium chloride in doses of from 8 to 12 Gm. a day, and potassium chloride, from 2 to 5 Gm. a day, are worthy of trial. Barker of Chicago makes successful use of the latter drug in his high potassium, low sodium diet, which consists essentially of a neutral ash diet with the addition of considerable potassium chloride by mouth. Perhaps the success of the "alkaline therapy" of Osman and Izod Bennett may also be due to the high intake of potassium salts in the solution recommended by them. This treatment, which on occasions I have found to be effective in cases in which nothing else seemed to work, consists in keeping the urine alkaline with a strong solution of potassium citrate, potassium bicarbonate, sodium citrate and sodium bicarbonate.

Lashmet has reported excellent results with his "acid-ash diet." This, too, is primarily a neutral ash diet plus hydrochloric acid. My experience with this has been limited and not entirely favorable.

Repeated transfusions are worth considering, the object being the quick replacement of protein and the increase of osmotic tension. The results in our clinic have not been particularly striking. I have not found it necessary to use the treatment devised by Hartman to increase the osmotic tension of the blood. He claims excellent results by the intravenous injection of 30 per cent acacia.

When accumulations of fluid in the body cavities become embarrassing they must be removed mechanically. Fluid can be drained out of the legs by means of incisions or the Southey tubes. These methods, however, are at times extremely dangerous because of the probability of local infection, particularly the dreaded erysipelas. The previously outlined forms of treatment are those most commonly used and are, I believe, most worthy of consideration.

Brilliant results are obtained frequently in the treatment of syphilitic lipoid nephrosis by careful antisyphilitic treatment plus the high protein diet.

In the early stages of nephrosis complicating chronic glomerular nephritis when renal function is good, the previously suggested treatment can be carried out. As renal function fails, however, great care must be exercised. The high protein diet may produce a marked rise of the blood urea nitrogen to levels that are dangerous. The protein intake must then be cut to definitely lower levels. Fortunately at this stage, with a progression of the glomerulonephritis, edema tends naturally to disappear, and treatment for the latter is less necessary. Diuretic drugs in glomerulonephritis are not effective and may well be followed by an actual decrease in urinary output, with signs of renal irritation.

In conclusion let me stress the three following points:

1. Chronic hypertensive nephritis is not a disease of the kidneys alone. Intelligent treatment demands an intelligent understanding of all the problems involved.

2. Overtreatment may be quite as harmful as undertreatment.

3. Chronic nephrosis is fully as great a nonrenal problem as chronic nephritis. Before thoroughly satisfactory treatment for this condition can be devised, much new knowledge must be forthcoming.

721 Huntington Avenue.

Therapeutics

THE THERAPY OF THE COOK COUNTY HOSPITAL

DISCUSSION OF PREVIOUSLY PUBLISHED ARTICLES

EDITED BY BERNARD FANTUS, M.D.
CHICAGO

THERAPY OF FRESH ACCIDENTAL WOUNDS

To the Editor:—I have just read Dr. Bernard Fantus's article in Therapeutics in THE JOURNAL, July 14. Speaking of the treatment of fresh accidental wounds, he says: "If anesthesia is required for the treatment of the wound, nitrous oxide-oxygen inhalation is the agent of choice." No mention is made of the use of local anesthesia, and I suppose from my observation that it is either a general anesthesia or nothing in common practice. For many years I have been infiltrating the edges of such accidental wounds after a preliminary cleansing, to facilitate a proper painless cleansing, and placing of the necessary stitches. When the needle for infiltration is started through the fresh wound surface, it is painless. I have never seen any other physician use local anesthesia in such a case and after many trials can see no insurmountable objections to the method.

M.D.

DISCUSSION.—The suggestion advanced no doubt has distinct merit. The only question is whether wounds thus treated under local anesthesia might not be more susceptible to infection than those that are not. This question, of course, can be settled only by extensive clinical experience with adequate control. Such experience, no doubt, exists in the keeping of the dental profession. A query was sent to a number of eminent dental surgeons. Unfortunately, the replies were not such as to permit definite conclusions. There were practically as many opinions advanced that extraction wounds inflicted under general anesthesia healed more kindly than those under local anesthesia as there were that no difference existed. The entire situation is a good example of the need for controlled observations in therapeutics.

THERAPY OF CONJUNCTIVITIS

To the Editor:—I have been much interested in the article on the treatment of the eye by Dr. Gifford, as I have some positive ideas on the treatment of gonorrheal cases with silver nitrate.

In his treatment of ophthalmia neonatorum, I do not think he gives silver the credit it deserves. He puts much stress on irrigation, which certainly is of value; but the real cure of these cases is the silver nitrate when properly applied. He speaks of several drugs and says "They may be useful."

I believe it a crime for a baby to go blind with gonorrheal ophthalmia. I believe every case can be cured with perfect results as far as vision is concerned. In an experience of forty years I have never lost an eye in an adult or babe in my own cases. From 1893 to 1898 I had the eye clinic at the Cook County Hospital, where we had ophthalmia neonatorum in

abundance. And at the Post-Graduate Hospital for about thirty years gonorrheal cases were not scarce.

At the Cook County Hospital I learned the following method, which if faithfully followed will always give the best of results:

A swab is made on an applicator or a tooth pick (not too large) and dipped into a 25 per cent solution of silver nitrate and any surplus wiped off. The lids, which are usually much swollen, are then everted and gently painted with the silver. A nurse, ready with a dropper of water, washes off any surplus from the everted lids. This is not absolutely necessary, as I have treated cases alone and closed the lids at once and have never seen bad results following this. The lids must be treated twice a day, and at the end of a week the eyes will be on the way to a rapid recovery. It is surprising how rapidly the swelling will subside. Sometimes there will be a discharge after the eyes seem well; this conjunctivitis will disappear in a day or two with the following prescription:

℞ Antipyrine ..... 3 grains
Hydrastis, solid extract..... 5 grains
Boracic acid..... 10 grains
Distilled water..... 1 ounce

Sig. One drop in the eye several times a day. The solid extract must be used, as the fluid extract or the tincture does not work efficiently.

The possibility of injury to the cornea with such a strong solution is nil. I had an ulcer on a patient who had lost the right eye by the most foolish treatment by a family physician, and when he found the gonorrheal infection commencing in the left eye he turned the case over to me. The ulcer extended horizontally across the cornea from edge to edge and was about 2 mm. in width. Besides treating the lids I painted the ulcer with the 25 per cent silver. The eye was saved and the cornea remained clear with good vision. I have seen the patient many times in the past thirty years and she has retained useful vision, but in her old age she has had to contend with a glaucomatous attack. I have treated many gonorrheal ulcers in the same way, with satisfactory results.

C. W. HAWLEY, M.D., Chicago.

DISCUSSION.—The letter was referred to Dr. Sanford R. Gifford, who writes: "I do believe that silver is indicated in some cases of gonorrheal ophthalmia but that most patients, especially children, get along as well, and perhaps better, without it if irrigations are efficiently performed. The 25 per cent silver nitrate solution is stronger than I have ever seen it used, and I doubt if it would be wise to advise such a solution for use by the average man. I have used 4 per cent and 8 per cent."

THERAPY OF FURUNCULOSIS

To the Editor:—Will you allow me to submit a treatment for furunculosis of the external auditory canal, which I have used over a period of fifteen years and which is not hastily devised or used without the most critical of observations. Failure is so rare that I resort to no other remedy. Pus formation occurs in a small percentage of cases, not to exceed 5 per cent, in the form of a small drop of pus, which comes away on the cotton; or, if the pus has approached the surface, it can be gently opened with an applicator.

As soon as a point can be localized or even when there is a general pain in the canal of the ear that one suspects may lead to furunculosis, pack the ear, over the tender point, with a cotton wad as solidly as it can be tolerated by the patient. The procedure is exactly this: Take as large a piece of cotton, of the very highest grade, that you think can be compressed into the canal of the ear. Then with any blunt instrument, such as the handle of an applicator, start to knead the cotton into the canal, and as the canal becomes filled and the plug of cotton becomes harder, it will be better to take some flat instrument like the one prong of a dressing forceps and fold the cotton in around the edge.

This treatment is quite painful, and the pain persists for from one-half to one hour, after which the pain ceases. The patient returns in twenty-four hours. If the pain is relieved and the cotton is in place and firm, it is left for another twenty-four hours. If the cotton is not firm and in place or if the patient is in pain, remove and repack with cotton. Furunculosis thus treated generally does not come to the formation of pus. It practically always disappears without this. The case that comes to the formation of pus usually has but one drop.

HARRY A. SMITH, M.D., Whittier, Calif.

MYCOTIC INFECTION OF THE NAILS

To the Editor:—In an article by Dr. Bernard Fantus on the therapy of the mycoses (THE JOURNAL, September 15) it is stated that surgical removal of the nails is advised in stubborn cases of onychomycosis. Having studied and treated a goodly number of such cases the past five years, I do not believe that surgical treatment is either advisable or necessary. If the case is really fungous in origin, which must be proved either by microscopic or by cultural methods, conservative local therapy will produce a cure. Often clinical diagnosis of ringworm of the nails is really psoriasis. When the etiology is absolutely proved, competent treatment will cure, whereas the condition often recurs after surgical removal, which is drastic therapy.

CLEVELAND J. WHITE, M.D., Chicago.

TOXIC EFFECTS OF EMETINE HYDROCHLORIDE—FEVER REGIMEN: USE OF ALCOHOLIC BEVERAGES

To the Editor:—I have been reading with interest and profit "The Therapy of the Cook County Hospital," edited by Dr. Bernard Fantus. There are, however, two therapeutic points that I should like to mention.

In connection with the treatment of amebiasis (THE JOURNAL, June 9, p. 1940), I fully agree with Dr. Fantus that emetine hydrochloride is very efficacious for the control of dysenteric symptoms but I think that greater emphasis should be given to the toxic effects, which in my experience are frequent even when the average dosage is employed. For example, I have repeatedly been obliged to discontinue emetine therapy on account of the appearance of circulatory disorders even before the usual course of from 7 to 10 grains in daily doses of 1 grain had been completed. Marked reduction of blood pressure was observed repeatedly and it may persist for weeks if not for months.

I believe that (*a*) the use of emetine hydrochloride should be restricted to cases of severe, acute dysentery or of liver abscess of amebic origin; (*b*) the patient should be confined strictly to bed while this drug is being used, and (*c*) the blood pressure, pulse rate and cardiac rhythm should be observed and recorded at least twice daily when emetine is being used.

The following articles contain information on the toxic effects of emetine:

Shattuck, G. C.: Outline of Treatment for Amebiasis, with Special Reference to the Use of Emetine, *Boston M. & S. J.* **190**: 766, 1924.
Anderson, H. H., and Reed, A. C.: Untoward Effects of Antiamebic Drugs, *Am. J. Trop. Med.* **14**: 269, 1934.

In the article entitled "Fever Regimen" (THE JOURNAL, August 18, p. 486) it is recommended that alcohol be administered freely to addicts when suffering from fever and that "in patients difficult to feed, most especially the aged, smaller doses . . . may be given with food."

I agree that addicts should not be deprived of their usual dose of alcohol during an attack of fever, but I believe also that alcohol may be used with even greater freedom in some cases of chronic infection with fever in which emaciation has resulted largely from inability to assimilate ordinary food in sufficient quantity. Under these conditions, even young persons who have never taken alcohol may absorb and utilize large quantities without showing the slightest evidence of intoxication and may, on the contrary, benefit greatly thereby.

GEORGE C. SHATTUCK, M.D., Boston.

Council on Physical Therapy

THE FOLLOWING ARTICLE HAS BEEN ADOPTED BY THE COUNCIL ON PHYSICAL THERAPY AND THE COMMITTEE ON STANDARDIZATION OF INSTRUMENTS AND DRUGS[1] OF THE SECTION ON OPHTHALMOLOGY OF THE AMERICAN MEDICAL ASSOCIATION. H. A. CARTER, Secretary.

PATENTED LENSES

FACTS VERSUS ADVERTISING COPY

ALFRED COWAN, M.D.
PHILADELPHIA

Theoretically, an ophthalmic lens should be free from the faults of chromatic aberration, curvature of field, distortion, annoying reflections from the surfaces and astigmatism of oblique pencils; but it is impossible to correct all these faults in a lens made of a single piece of glass.

Clinically, however, it is known that chromatic aberration, distortion and curvature, in ordinary ophthalmic lenses, are not noticeable enough to cause discomfort to the wearer. Reflections from the surfaces are sometimes annoying but can usually be remedied by proper adjustment. The spherical aberration that must be corrected in a photographic lens in order to produce a clear image to the edge of the plate does not apply to an ophthalmic lens. A clear image out to the periphery of the retina, even if it were possible, could not be appreciated. The retinal image is distinctly seen only over an extremely small area at the fovea and, therefore, it is here and nowhere else that a clear image must be formed—imaged sharply or not, on any other part of the retina objects appear blurred. For this narrow pencil of light, necessary to form the foveal image, only a small portion of the correcting lens is used at one time.

Thus, if the eye were immovable, so that the relative position of the lens before it were unchanged and only a small portion at the center of the glass constantly utilized, the combination of an eye and its correcting glass would differ from nearly every other optical instrument in that none of the ordinary aberrations need be considered. Any type of lens having the proper dioptric power in the utilized portion would be satisfactory. But the eye continually moves around in the orbit and as it turns and looks through the periphery of the lens there is, besides other changes, a certain amount of blurring of the image due to the astigmatism of oblique pencils of light. This is the only aberration in an ophthalmic lens that is serious enough to require special attention and one which, fortunately, can be eliminated in a single piece of glass.

A convex surface produces a certain type of astigmatism of oblique pencils, which will be neutralized by an opposite type of astigmatism by a concave surface. The proper combination of convex and concave surfaces can be found by a tedious and complicated process for each particular lens power, so that the aberration of one surface will neutralize that of the other. The result is always a deep curved type of lens.

Provided the distance between a lens of required power and the center of rotation of the eye is known, and also the thickness of the glass, and the distance of the object viewed, the astigmatism of oblique pencils of light can be corrected out almost to the rim of an ordinary spectacle lens by giving the lens a certain curvature or front-back combination of powers. (For example, disregarding certain small differences, a convex lens of 2 diopters may be bent from the flattest form—1 diopter on each side—through a plano on one side and + 2 on the other, — 2 on one side and + 4 on the other, to — 6 on one side and + 8 on the other, and so forth, within limits, as long as the algebraic sum of the powers of the two sides equals + 2.) This type of lens, the purpose of which is to minimize the astigmatism of oblique pencils, is generally known as a point focal, wide angle or corrected lens.

Tscherning in 1908 constructed a graph giving the various combinations of front and back surfaces which, when given to lenses, will correct out the astigmatism of oblique pencils within a solid angle of 60 degrees for powers ranging from — 20 to + 7 diopters.

To be exact, the lens must be constructed for a fixed object distance and if the calculation is made for an object placed at infinity, which is usually the case, the lens will be theoretically inaccurate for every other distance. That is to say that, for the same person, the lens designed for distant vision will have an entirely different coflexure from that designed for the reading distance. This means that it is absolutely impossible to correct out the astigmatism of oblique pencils in both the distance and reading portions of bifocals. One or the other must be wrong. In order to produce a perfect wide angle or point focal lens, therefore, it would be necessary to have a different combination of surfaces for every dioptric power and for every object distance. To accomplish this, the power of each surface would need to run into three or more decimal places. Surfaces so accurate cannot be ground and, furthermore, it is impracticable from the standpoint of the manufacturer to grind different curves for every power; nor is this necessary for the requirements of an ophthalmic lens. An ophthalmic lens need only be approximately correct for practical purposes, especially in the low powers, since very small astigmatic errors as well as other aberrations are easily ignored by a healthy eye.

Those having any knowledge of the literature of geometric optics know that practically nothing of what has been stated here is new. Deeply curved or meniscus lenses were mentioned by Kepler as early as 1604 and recommended by Hertel in 1716. Toric lenses were ground by Anton Wagner in Philadelphia fifty years ago. Although the theory of wide angle lenses has been known for a great many years, certain manufacturers imply in their advertisements that they have made a new discovery and that they, and only they, have the ideal ophthalmic lenses—corrected to the very edge for both the error of marginal focal power and the astigmatism of oblique pencils, even in bifocals. No one knows better than they that this is not true. What is most glaring is that while no two of the many patented forms are alike, each is claimed to be perfect. As a matter of fact, a lens of this kind is a compromise at best and any one is just about as good as another – and no more comfortable to the average glass wearer than the series of lenses that I have suggested in several previous articles.

The following paragraph from the patent papers of one of the largest advertisers of wide angle glasses will show what has really been accomplished by the lens designers of most manufacturers and is much more in keeping with the truth than anything they care to state

1. The Committee on Standardization of Instruments and Drugs is composed of Dr. Sanford R. Gifford, chairman, Dr. Francis Heed Adler, Dr. Clifford Walker, Dr. Jonas-Friedenwald and Dr. John MacNie.

in their advertising copy: "Always keeping in mind the commercial production of the various powers of lenses so that the same shape surfaces may be used for as many different power lenses as possible within limits of marginal error."

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

DIPHTHERIA TOXOID, ALUM PRECIPITATED (REFINED) (See New and Nonofficial Remedies, 1934, p. 393).

Parke, Davis & Company, Detroit.

Diphtheria Toxoid, Alum Precipitated (Refined)-P. D. & Co.—Prepared by detoxifying diphtheria toxin of 0.1 L+ dose with a 0.4 per cent solution of formaldehyde, adding to the resultant toxoid sufficient potassium aluminum sulphate to make a solution of 2 per cent, washing the precipitate with physiologic solution of sodium chloride and suspending in a sufficient amount of physiologic solution of sodium chloride to bring it back to the original volume. The finished product is preserved with sodium ethyl mercuric-thiosalicylate 1: 10,000 (Merthiolate). It is standardized according to the requirement of the National Institute of Health: guinea-pigs weighing 500 Gm. given one human dose must produce at the end of six weeks at least two units of diphtheria antitoxin in each cubic centimeter of blood.

Marketed in packages of one 1 cc. vial and in packages of one 10 cc. vial containing one and ten doses, respectively.

DEXTROSE (See New and Nonofficial Remedies, 1934, p. 270).

The following dosage forms have been accepted:

Ampules Solution Dextrose (d-Glucose) U. S. P., 10 Gm., 20 cc.: Each ampule contains dextrose-U. S. P., 10 Gm., in distilled water to make 20 cc.

Prepared by the Cheplin Biological Laboratories, Inc., Syracuse, N. Y.

Ampules Solution Dextrose (d-Glucose) U. S. P., 25 Gm., 50 cc.: Each ampule contains dextrose-U. S. P., 25 Gm., in distilled water to make 50 cc., and is accompanied by an ampule containing 2 cc. of a buffer solution composed of dibasic sodium phosphate, 0.3 Gm., and monobasic potassium phosphate, 0.024 Gm., in distilled water.

Prepared by the Cheplin Biological Laboratories, Inc., Syracuse, N. Y.

Ampules Solution Dextrose (d-Glucose) U. S. P., 50 Gm., 100 cc.: Each ampule contains dextrose-U. S. P., 50 Gm., in distilled water to make 100 cc. and is accompanied by an ampule containing 4 cc. of a buffer solution composed of dibasic sodium phosphate, 0.6 Gm., and monobasic potassium phosphate, 0.048 Gm., in distilled water.

Prepared by the Cheplin Biological Laboratories, Inc., Syracuse, N. Y.

Ampules Solution Dextrose (d-Glucose) U. S. P., 25 Gm., 50 cc. (Buffered): Each ampule contains dextrose-U. S. P., 25 Gm., in distilled water to make 50 cc. The solution is buffered with sodium citrate 0.25 per cent.

Prepared by the Cheplin Biological Laboratories, Inc., Syracuse, N. Y.

Ampules Solution Dextrose (d-Glucose) U. S. P., 50 Gm., 100 cc. (Buffered): Each ampule contains dextrose-U. S. P., 50 Gm., in distilled water to make 100 cc. The solution is buffered with sodium citrate 0.25 per cent.

Prepared by the Cheplin Biological Laboratories, Inc., Syracuse, N. Y.

UCOLINE COD LIVER OIL CONCENTRATE.—The unsaponifiable fraction of cod liver oil, prepared by the Marcus process, dissolved in a bland mineral oil. Each gram of the solution contains 5,500 U. S. P. X (1925) units of vitamin A and 1,800 A. D. M. A. units of vitamin D (according to the U. S. P. X, Revised, 1934, 7,700 units of vitamin A and 492 units of vitamin D).

Actions and Uses.—Ucoline Cod Liver Oil Concentrate possesses properties similar to those of cod liver oil so far as these depend on the fat soluble vitamin content of the latter.

Dosage.—From 3 to 6 drops of the concentrate solution three times daily (a glass dropper is included in the marketed package, designed to deliver one minim per drop); for the tablets, 1 to 2, three times daily.

Manufactured by the Ucoline Products Company, Chicago, under U. S. patent 1,690,091 (Oct. 30, 1928, expires 1945). No U. S. trade mark.

Ucoline Cod Liver Oil Concentrate Tablets.—Each sugar coated tablet contains 0.02 Gm. of the dry concentrate. They are assayed to contain in each tablet not less than 1,000 U. S. P. X (1925) units of vitamin A and not less than 500 A. D. M. A. units of vitamin D (according to the U. S. P. X, Revised, 1934, 1,400 units of vitamin A and 150 units of vitamin D). This represents 1,790 U. S. P. X (1925) units of vitamin A (2,506 U. S. P. X, Revised, 1934), and 895 A. D. M. A. units of vitamin D (276 U. S. P. X. Revised, 1934) per gram of tablet.

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT. PAUL NICHOLAS LEECH, Secretary.

YEAST VITAMIN-HARRIS TABLETS AND BREWER'S YEAST-HARRIS, MEDICINAL, NOT ACCEPTABLE FOR NEW AND NONOFFICIAL REMEDIES

Yeast Vitamin-Harris Tablets and Brewer's Yeast-Harris, Medicinal, are among the vitamin preparations marketed by the Harris Laboratories, Tuckahoe, N. Y. (Isaac F. Harris, Ph.D., director). Recently these products have been widely advertised to the medical profession directly, and to the public indirectly, for a pretentious array of diseases and disorders, many of which are listed on the label and in the advertising.

Full-page advertisements have appeared in medical journals in which the product was referred to as having been

" . . . successfully used and prescribed in anemia, herpes infection, pellagra, ulcers, arthritis and diabetes."

The same claims appear on the folder that accompanied the trade package.

The claim that vitamin B may be used successfully in the treatment of diabetes is unwarranted. Diabetes represents, in part at least, a deficient activity on the part of the islands of Langerhans in the production of the metabolic hormone insulin. There is no evidence in all the extensive literature on diabetes that has been developed since the discovery of insulin that it (insulin) can be produced in any other manner or in any other place than by and in the islands of Langerhans of the pancreas. Nor has it been proved conclusively that there is any other drug, product or chemical compound having even a remotely similar effect on the blood sugar level. Further, there is lack of evidence that yeast, vitamin B, or any other known vitamin has any effect on the faulty dextrose utilization in uncomplicated diabetes.

The claim that yeast is effective in the treatment of pernicious anemia appears to be an obvious misinterpretation of known facts and published data. It has been shown (Castle and others) that autolyzed yeast and other substances containing the vitamin B complex, when mixed with normal gastric juice, may produce a reticulocytosis in patients with pernicious anemia. Although in a rare case autolyzed yeast alone may have some effect, yeast by itself must be considered ineffective and cannot be recommended as such in pernicious anemia. It may be of distinct value in certain other types of macrocytic anemia. However, in all such types of macrocytic anemia liver and stomach preparations are effective. In the macrocytic anemia of pregnancy in India, Wills has shown that autolyzed yeast is effective. Similarly, Castle and Rhoads have found autolyzed yeast effective in certain patients with sprue. The facts at present available indicate that the active agent in autolyzed yeast is not to be identified with any designated portion of the vitamin B complex, although this was the tentative suggestion of Castle and Strauss. Nor is there evidence that in addisonian pernicious anemia any vitamin product by itself has a specific effect (such as is claimed for Yeast Vitamin-Harris) in increasing the reticulocyte count and restoring a normal blood picture. The only clinically proved indications at the present time for the use of vitamin B (and its related fractions) lie in the so-called deficiency diseases of beriberi, polyneuritis and, probably, pellagra.

The attempt of the Harris Laboratories to sell its products (as "useful and successful agents" in two such grave diseases as diabetes mellitus and pernicious anemia) by advertising in the medical journals is not a compliment to the intelligence of the medical profession. The conscientious practitioner would do well to adhere to the established armamentarium in combating such serious conditions as diabetes and pernicious anemia. Insulin and liver and stomach preparations are proved, whereas yeast has only the claims of a manufacturer to recommend it.

Neither the Harris trade package nor the accompanying literature contains any statement of potency, nor does the Council know of any published protocols on the assay of the products as purchased on the open market.

The Council declared Yeast Vitamin-Harris Tablets and Brewer's Yeast-Harris, Medicinal, not acceptable for New and

Nonofficial Remedies because they are marketed with no statement of potency on the labels; with names of diseases for which they are recommended appearing on the label; and with exaggerated, unwarranted and misleading therapeutic claims.

Committee on Foods

THE COMMITTEE HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT. RAYMOND HERTWIG, Secretary.

NOT ACCEPTABLE

CURTISS MILK NUT LOAF

The Curtiss Candy Company, Chicago, submitted to the Committee on Foods a chocolate enrobed candy containing corn syrup, sucrose, roasted peanuts, coconut butter, gelatin, glycerin, tapioca starch, vanillin and coumarin.

Analysis (submitted by manufacturer).—

	per cent
Moisture	5.7
Ash	0.6
Fat (acid hydrolysis method)	20.5
Protein (N × 6.25)	6.2
Reducing sugars as dextrose	10.6
Sucrose (copper reduction method)	32.5
Crude fiber	0.7
Carbohydrates other than crude fiber (by difference)	66.3

Discussion of Name.—The name "Milk Nut Loaf," signifying that milk is an important ingredient, is deceptive as to the composition and nutritional values of the candy, in that milk is not a component. Descriptive names for foods should be truthfully informative. Good advertising is not possible without correct and appropriate names for foods.

The company was informed of the criticisms of the Committee but for business reasons is unwilling to correct the name. The candy will therefore not be listed among the accepted products of the Committee on Foods.

ACCEPTANCES WITHDRAWN

APPROVAL TOMATO JUICE
Distributor.—M. E. Horton, Inc., Washington, D. C.

CALIFORNIA FRUIT GROWERS EXCHANGE ADVERTISING FOR SUNKIST ORANGES, LEMONS AND GRAPEFRUIT
Sponsor.—California Fruit Growers Exchange, Los Angeles.

CEDAR HILL BRAND TOMATO JUICE
Distributor.—Hassendeubel Grocery Company, St. Louis.

COMET BROWN RICE
COMET BROWN RICE FLAKES
Manufacturer.—Comet Rice Company, New York.

EVER READY BISCUIT FLOUR (PREPARED)
Manufacturer.—F. M. Brown's Sons, Sinking Springs, Pa.

HARDY'S TWIN LOAF BREAD
Manufacturer.—Hardy Baking Company, Flint, Mich.

HORLICK'S MALTED MILK LUNCH TABLETS (PLAIN AND CHOCOLATE FLAVORED)
Manufacturer.—Horlick's Malted Milk Corporation, Racine, Wis.

JEWEL COCOA
JEWEL EXTRA FANCY HEAD BLUE ROSE RICE
Distributor.—Jewel Tea Company, Inc., Barrington, Ill.

LAUB'S QUALITY BREAD
Manufacturer.—The Jacob Laub Baking Company, Cleveland.

LONG ROYAL BREAD
ROYAL TABLE QUEEN BREAD
Manufacturer.—Royal Baking Company, Ogden and Salt Lake City, Utah.

MEYERS CORN SYRUP WITH CANE FLAVOR
Distributor.—Meyers, Walnut Ridge, Ark.

MITY GOOD BRAND GOLDEN TABLE SYRUP
Distributor.—Fox River Grocery Company, Appleton, Wis.

MOTHER'S JUMBO BREAD
Manufacturer.—M. Erickson Bakery Company, Inc., LaCrosse, Wis.

MURI BRAND TOMATO JUICE
Distributor.—New England Importation Corporation, Boston.

NEW STATE BRAND TOMATO JUICE
Distributor.—The Williamson-Halsell-Frazier Company, Oklahoma City.

N. J. C. PURE FOOD BRAND JUICE OF FANCY WHOLE TOMATOES
N. J. C. PURE FOOD BRAND PANCAKE SYRUP
N. J. C. PURE FOOD BRAND FANCY WHITE SYRUP
Distributor.—Northern Jobbing Company, Chicago and St. Paul.

PORTAGE BRAND GOLDEN CORN SYRUP WITH CANE FLAVOR
PORTAGE BRAND CRYSTAL WHITE SYRUP
Distributor.—Portage Wholesale Company, Portage, Wis.

SAMOS BRAND WHITE CRYSTAL SYRUP
Distributor.—Samos Wholesale Grocery Company, Cleveland.

STROEHMANN'S KEW BEE BREAD
STROEHMANN'S MILK BREAD
Manufacturer.—Stroehmann Brothers Company, Harrisburg, Pa.

USEMORE BRAND GOLDEN SYRUP
USEMORE BRAND WHITE TABLE SYRUP
Distributor.—Service Grocer Company, Detroit.

WALDENSIAN TAR HEEL BREAD
Manufacturer.—Waldensian Baking Company, Valdese, N. C.

YACHT CLUB BRAND CORN SYRUP WITH CANE FLAVOR
Distributor.—Bemis, Hooper, Hays Company, Oshkosh, Wis.

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Since the sponsors of the listed accepted foods are not willing to comply with this simple requirement to assure that the products and the advertising are being maintained acceptable, acceptance has been withdrawn.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, NOVEMBER 3, 1934

THE NATURE OF ANTIBODIES

The question of the nature of antibodies is of practical as well as theoretical importance. The more complete the knowledge of their nature, the more favorable the conditions for preparing them for therapeutic and diagnostic use. Insight into the mechanisms of immunity is dependent in large measure on an understanding of the composition and structure of antibodies. Many attempts have been made to separate the antibodies from the other constituents of serum. On variation in the salt concentration of serum the antibodies in general come down with the globulin fraction no matter what method is used, and as a rule antibodies are not associated with or limited to any particular form of globulin thus prepared. The methods now in use for the concentration and purification of diphtheria and other antitoxins are based on the salt precipitation of serum globulins. Under the proper conditions, alcohol precipitates proteins as well as antibodies without any damage to the latter, so long as the proteins are not denatured in the process. By precipitation in low salt concentration as well as with alcohol, the specific antibodies in antipneumococcus horse serum can be secured in relatively high purity in a fraction of the serum globulin. On adsorption by aluminum hydroxide and other substances as well as on cataphoresis, the antibodies appear to remain in association with the globulin.

Since antibodies form specific combinations with antigens, many efforts have been made to recover the antibody from the antigen-antibody compound; e. g., agglutinins from agglutinated bacteria or red corpuscles. In the experiments of this category, those dealing with the antigenic polysaccharides of pneumococci, which can be prepared free from protein, and antipneumococcus horse serum, appear to have yielded the best results. This antigen-antibody precipitate can be washed free from the inactive proteins in the horse serum and then the antibody protein in the precipitate can be dissociated by alkaline solution. Without going into details, let it suffice to say that Felton [1] has recombined the antibody protein and the antigen into the original complex. Felton concludes that the antibodies in his antipneumococcus horse serum are of protein nature. This conclusion is in full harmony with the outcome of the attempts so far to prepare antibodies in pure form from antiserum; namely, that they cannot be separated from proteins. Heat, alcohol, organic solvents and other factors that alter or denature proteins also change or destroy the peculiar properties of proteins. When specific precipitin serum is added to a serum containing agglutinin or antitoxin, the agglutinin or antitoxin is removed in the resulting precipitate; in the case of diphtheria, antitoxin diphtheria toxin is bound by such a precipitate.

Further evidence of the protein nature of antibodies is furnished by the precipitate in the specific precipitin reaction. This precipitate contains more protein than can be derived from the antigen used in the reaction; in fact, the precipitate consists largely of globulin from the antiserum. When bacteria or red corpuscles are acted on by specific antiserum they conduct themselves in an electric field as if coated by a layer of globulin, and the globulin or protein attached to particulate antigens in these and similar experiments has been shown by immunologic reactions to be the same as that in the antiserum. Quantitative tests point to this globulin as the actual antibody. Marrack [2] concludes a thorough and detailed report of the work on the nature of antibodies with the statement that according to their properties antibodies "consist of modified serum globulin," the antibody molecules differing from the normal globulin molecules either by rearrangement in structure or by the presence of a prosthetic group, which gives them the power to combine with antigen.

1. Felton, L. D.: Pneumococcus Antibodies—What Are They? Science **79:** 277 (March 23) 1934.

2. Marrack, J. R.: The Chemistry of Antigens and Antibodies, Medical Research Council, Special Report Series, No. 194, London, 1934.

HETEROTOPIC INTESTINAL MUCOSA AS A POSSIBLE FACTOR IN THE GENESIS OF GASTRIC ULCER

The occurrence of heterotopic intestinal mucosa in the mucous membrane of diseased stomachs has been known for some time. It has been found in cases of chronic gastritis, carcinoma, achylia and pernicious anemia. Most observers regard it as an instance of metaplasia arising on a basis of an inflammatory process. This theory found its support in the fact that heterotopic islands of intestinal mucosa occurred with greatest frequency in chronic atrophic gastritis and only rarely in normal stomachs. According to this view, defects in the gastric mucosa resulting from an inflammatory process permit the growth of a new and indifferent epithelium, which may later differentiate into the type resembling intestinal epithelium. The regeneration is therefore of a faulty, atypical kind rather than a true metaplasia. Moszkowitz [1] in fact designated it

1. Moszkowitz: Zur Pathologie des ulcusbereiten Magens, Arch. f. klin. Chir. **122,** 1922.

as "indirect metaplasia." This view was shared by Lubarsch, Faber, Heyrovsky and, more recently, by Puhl, Stoerck, Konetzny and others.

The recent report by Clar [2] from Schloffer's clinic in Prague is interesting because it offers observations that seem to refute the correctness of the metaplastic theory. Clar views this heterotopic tissue not as a metaplasia but as a true congenital displacement. In their relation to the gastric juice these heterotopic islands of intestinal mucosa constitute a locus minoris resistentiae and therefore a possible factor in the genesis of the gastric ulcer. In an examination of fifteen fetuses, Clar found intestinal mucosa regularly present in the stomachs of fetuses up to the seventh month. The frequency of the occurrence diminishes with increase in age. Thus, in three full term infants this condition was present in only one. In twelve cadavers whose histories do not mention gastric disease and in twenty-six gastric specimens resected for the cure of a duodenal ulcer this heterotopy was not found once. Apparently these displacements tend to disappear with further growth of the individual because of the comparatively weaker growth than that of the environmental tissues. Clar found such islands in six out of ten gastric specimens resected for gastric ulcer and in one out of three specimens resected for a pyloric ulcer. It is noteworthy that these elements were found not only in the immediate neighborhood of the ulcer but in other parts of the stomach as well, sometimes as far as 10 cm. away from the ulcer. The tissue in question was surrounded by a normal gastric mucosa. It varied in size from a single crypt, or a few crypts, to circular formations 4 by 5 mm. in diameter. Their epithelium, according to Clar, resembled that of intestinal mucosa in every characteristic. There were to be seen the columnar cuticular cells, goblet cells, Paneth's cells and chromaffin cells. Clar failed to find evidence of a chronic gastritis in any of his cases. As congenital displacements these islands bear comparison with islands of gastric mucosa found in the esophagus and in Meckel's diverticulum, and with islands of pancreatic tissue found in the stomach wall. The author admits the far more frequent occurrence of heterotopic intestinal mucosa in the stomachs the seat of a pathologic process, particularly of chronic atrophic gastritis, but believes that the intestinal epithelium covering these defects was derived from a preexisting intestinal epithelium which proliferated under the stimulus of inflammation.

Müller [3] called attention to developmental disturbances as a possible basis for the formation of a gastric ulcer. He pointed out that, when an ulcer develops in a Meckel's diverticulum containing gastric mucosa, the initial peptic damage is seen most frequently not in the gastric tissue but in the intestinal tissue. This localization speaks for a direct peptic damage of the exposed intestinal mucosa by the secretion of the adjacent gastric mucosa. While unanimity is absent on the question of whether the intestinal mucosa can be digested by the gastric juice, the author feels that Buchner's answer in the positive is sufficiently supported by facts to be accepted. The latter points to the case of an ulcer in Meckel's diverticulum, to the well known postoperative jejunal ulcer of a gastro-enterostomy, and to the ulcer in the Mann-Williamson animal experiment. It appears, therefore, that heterotopic islands of intestinal mucosa occurring in the gastric mucosa constitute a locus minoris resistentiae and as such may play a part in the genesis of the gastric ulcer. Its rôle perhaps is the creation of the primary defect in Aschoff's sense. The primary defect or erosion may develop further in the presence of other factors favoring an inflammatory-ulcerative process.

Regarded in the light of J. Bauer's concept, a congenital displacement of the kind that has been discussed confers a predisposing constitutional inferiority on the stomach containing it. The localization of this heterotopic tissue in the pyloric, prepyloric and lesser curvature areas explains, in accordance with the mechanical-functional factors elucidated by Aschoff and K. H. Bauer, the failure on the part of the primary defect or erosion to heal.

The heterotopic islands of intestinal mucosa found in the stomach the seat of gastritis or of an ulcer is therefore not the result of the existing pathologic condition but its cause. This adds another theory to some forty already existing, which attempt to elucidate the genesis of the gastric ulcer.

2. Clar, Fritz: Ueber Heterotope Darm-Schleimhaut im Magen und ihre Bedeutung für die Ulcusgenese, Beitr. z. klin. Chir. **160**: 145-160 (No. 2) 1934.

3. Müller, P. F.: Ueber das Ulcus pept. perforans des persist. Meckelsches Divertikel und seine Verwandtschaft mit dem Ulcus Ventriculi, Beitr. z. klin. Chir. **115**: 560, 1919.

ARTIFICIAL FEVER THERAPY

The limitations for the use of artificial fever therapy are becoming more clearly defined. A recent report of Simpson [1] is based on the use of the Kettering hypertherm, a simple air conditioned cabinet with which it is possible to elevate the patient's temperature rapidly and to maintain it at the desired level for an extended period. The use of this form of hyperpyrexia has been largely concentrated on syphilis. One hundred and seventeen syphilitic patients were treated, and in eighty-seven the course was completed. The best results were obtained by combining antisyphilitic therapy (e. g., bismuth compounds, iodobismitol or tryparsamide) with at least fifty hours of sustained fever at approximately 106 F. The sessions of fever were usually given weekly for ten weeks, with five hours of sustained fever at each session. The antisyphilitic drug was injected half an hour before each session of fever. After completion of this program

1. Simpson, W. M.: Artificial Fever Therapy, Proc. Staff Meet., Mayo Clin. **9**: 567 (Sept. 19) 1934.

the patients were given a follow-up course of antisyphilitic chemotherapy at weekly intervals for twenty weeks.

Of sixteen patients with dementia paralytica, twelve obtained complete clinical remission, two improved markedly and were restored to a working status, one showed moderate improvement, and one was unimproved. The spinal fluid Wassermann and Kahn reactions were reversed to negative in six instances, became less strongly positive in six and remained positive in three. The blood Wassermann and Kahn reactions were reversed to negative in eight, became less positive in three and remained positive in four. There were seven patients in the taboparetic group. Improvement in mental orientation occurred in six. Subsidence of root pains occurred in all, but two patients experienced recurrence of pain, which was controlled by additional treatment. In four of the five patients with ataxia, the gait improved. The spinal fluid Wassermann and Kahn reactions were reversed to negative in two instances, became less strongly positive in one and remained positive in four. The blood Wassermann and Kahn reactions were reversed to negative in one, became less positive in one, remained positive in two, remained negative in three and became more strongly positive in one. One patient in this series had a syphilitic neuroretinitis, which responded promptly to the treatment.

Of nine patients with tabes dorsalis, ataxia was a prominent symptom in eight; two were restored to a normal gait, two showed 50 per cent improvement, two showed 75 per cent improvement and two were not improved. Root pains were abolished in all. In one patient the symptoms of cord bladder disappeared. The spinal fluid reactions were reversed to negative in two, became less strongly positive in three and remained positive in four instances. In a group of ten patients with diffuse central nervous system syphilis with eye symptoms predominating, favorable results were promptly obtained in six with interstitial keratitis, two with choroiditis, one with neuroretinitis and one with iritis. In six patients with asymptomatic neurosyphilis, the spinal fluid Wassermann and Kahn reactions of all were reversed to negative. There were six so-called blood Wassermann-fast cases. The serologic reactions were reversed to negative in three, became less strongly positive in two and remained positive in one.

Simpson reports some studies on the use of this treatment in early syphilis and in arthritis. He believes that in early syphilis the results are often favorable, though there has been insufficient observation from which to draw conclusions. The problem in arthritis appears to be one of selection of the proper type of patients. In the hands of unskilled workers, he believes, the possibility of doing harm with this form of therapy is perhaps greater than that of doing good. Its use should therefore be confined for the present to those having an intimate knowledge of the subject.

Current Comment

NOBEL PRIZE AWARDS IN MEDICINE

The Nobel prize in medicine for 1934 was awarded last week to three physicians of the United States: Drs. George R. Minot and William P. Murphy of Boston and Dr. George H. Whipple of Rochester, N. Y. The sum to be awarded is reported to be $41,000. The research leading to the present clinical use of liver in pernicious anemia has been repeatedly reviewed in these columns. Many of the significant studies appeared first in THE JOURNAL. Briefly, Whipple and his associates showed that certain foods, especially liver, will induce rapid regeneration of blood in dogs made anemic by bleeding. Thereafter, Minot and Murphy applied the method clinically, made controlled studies in the hospital, and published their most significant early paper in THE JOURNAL in August 1926. One may, as is usual in such cases, find occasional references to the use of liver in the diet as far back as the published literature of medicine goes, but the prize is awarded to the investigators mentioned because of their establishment by scientific methods of facts that have led to the almost universal use of their suggestions in the treatment of the anemias. The story of the anemias, as Dr. Whipple modestly remarked when informed of the award, is far from finished and the work must go on. Like other new conceptions in the field of medicine, the new phase in the treatment of pernicious anemia has opened up a great land of promise for investigators of the blood in health and in disease. The deficiencies of leukocytes, of thrombocytes and of various chemical constituents of the blood offer a great opportunity for further study. When one realizes how far we have progressed since 1920 in relationship to our knowledge of the blood and its disorders, the hope for the future is greatly enhanced. By such awards as the Nobel prize, civilization pays some part of its debt to the accomplishments of medical science. That debt is already so great, however, that it can never be fully repaid. Yet the medical scientist has asked but little in the way of recompense for his efforts; he merely hopes to continue at his work without the obstructions of unenlightened interference from political or commercial sources.

EFFECTS OF TOBACCO SMOKING

The possible important physiologic effects of tobacco smoking have been investigated from several angles. Recently Dill, Edwards and Forbes[1] reported on the relation of smoking to blood sugar, blood lactic acid and metabolism. The subjects for their experiments remained at rest in the fasting state for ninety minutes before smoking and for forty-five minutes afterward. Each subject smoked one cigaret, inhaling the smoke during a period of from five to ten minutes. Capillary blood was obtained twice before smoking, one or more times during smoking, and frequently during the sub-

1. Dill, D. B.; Edwards, H. T., and Forbes, W. H.: Tobacco Smoking in Relation to Blood Sugar, Blood Lactic Acid and Metabolism, Am. J. Physiol. **109**: 118 (July) 1934.

sequent forty-five minutes. Three samples of venous blood were also obtained. The sugar determinations were made by the micro method of Folin and Malmros. In addition to observations made on ten subjects in the fasting state, similar experiments were carried out on two subjects beginning about three hours after a light breakfast. They concluded that smoking one cigaret produced no change in blood sugar, lactic acid or respiratory quotient. In regard to oxygen consumption, however, there appeared to be significant alterations subsequent to smoking. While the oxygen consumption after smoking may remain unchanged in some subjects, in others it may increase as much as 10 or 15 per cent. Although this increase is of small magnitude and of doubtful general importance, it does indicate that subjects for basal metabolic rate testing should not smoke in the morning during which the test is to be made.

Association News

MEDICAL BROADCASTS

Columbia Broadcasting System

The American Medical Association broadcasts on a western network of the Columbia Broadcasting System each Thursday afternoon on the Educational Forum from 4:30 to 4:45, central standard time. The next three broadcasts will be delivered by Dr. W. W. Bauer. The titles will be as follows:

November 8. Your Child's Sleep.
November 15. The Health Audit.
November 22. Eat, Drink and Be Merry.

National Broadcasting Company

The American Medical Association broadcasts under the title "Your Health" on a Blue network of the National Broadcasting Company each Tuesday afternoon from 4 to 4:15, central standard time. The next three broadcasts will be as follows:

November 6. The Fight Against Appendicitis, W. W. Bauer, M.D.
November 13. Does Medicine Cost Too Much? Morris Fishbein, M.D.
November 20. The Doctor of Tomorrow, W. W. Bauer, M.D.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Society News.—At a meeting of the Tuscaloosa County Medical Society at Bryce Hospital, Tuscaloosa, October 15, members of the staff presented the program. Drs. James S. Tarwater and Frank A. Kay discussed dementia praecox, and Dr. Toombs Lawrence exhibited cases of paranoia. Dr. Thomas K. Lewis, Birmingham, addressed the society in September on treatment of heart block.

University News.—Dr. James S. McLester, professor of medicine, University of Alabama School of Medicine, and President-Elect, American Medical Association, delivered the annual Gorgas address before the La Fayette Guild Chapter of the Gorgas Medical Society at the university, October 3. The occasion was in commemoration of the eightieth anniversary of the birth of William Crawford Gorgas. Dr. Allan Walker Blair has resigned as associate professor in pathology and bacteriology to accept a surgical appointment in the Winnipeg General Hospital, and Dr. James B. McLester, Birmingham, has been appointed clinical assistant in medicine at the university.

DELAWARE

Society News.—Dr. Temple S. Fay, Philadelphia, addressed the New Castle County Medical Society, October 16, on "Neurologic Signs in General Practice." Dr. Fay is professor of neurosurgery in Temple University School of Medicine. Dr. Fielding H. Garrison, Baltimore, discussed "English Medicine and Anglo-Saxon Life" before the society, September 18.

State Medical Meeting and Election.—Dr. Jerome D. Niles, Townsend, was elected president of the Medical Society of Delaware at its annual meeting in Dover, October 9-10. Vice presidents elected are Drs. Joseph B. Waples Jr., Georgetown, and Clarence J. Prickett, Smyrna. The next annual meeting will be held in Wilmington in October. The scientific program included, among others, the following speakers:

Dr. Joseph S. McDaniel, Dover, The History and Progress of Medicine.
Dr. Joseph P. Wales, Wilmington, A Preliminary Report on Tuberculosis Prevention in Delaware.
Dr. Robert W. Tomlinson, Wilmington, Gastro-Intestinal Disease: Some Recognized Essential Diagnostic Procedures.
Dr. Lay Martin, Baltimore, Recent Investigations on the Physiology of Gastric Secretion and Its Relation to Clinical Medicine.
Dr. Henry D. Jump, Philadelphia, Treatment of Pneumonia by Means of Serum, Oxygen Tent and Pneumothorax.
Dr. P. Brooke Bland, Philadelphia, Intracranial Injuries of the New-Born from the Standpoint of the General Practitioner.
Hon. Daniel J. Layton, chief justice of Delaware, Medicolegal Problems.
Dr. Charles E. Wagner, Wilmington, Pyelitis in Children.
Dr. John B. Baker, Milford, Infant Feeding, with Special Reference to Lemon Feeding.
Dr. George C. McElfatrick, Wilmington, Results of High Voltage X-Ray Treatment in Metastatic Carcinoma of Bones.
Dr. Douglas M. Gay, Wilmington, Prevention and Cure of Cancer.
Dr. Emil R. Mayerberg, Wilmington, Nasal Accessory Sinuses from the Standpoint of the General Practitioner.
Dr. William Bates, Philadelphia, Faulty Body Mechanics a Factor Causing Diagnostic Errors.

ILLINOIS

Society News.—Speakers before the St. Clair County Medical Society in East St. Louis and Belleville in October were, respectively, Drs. Ellis Fischel and Clinton W. Lane, St. Louis, on "Cancer of the Breast" and "Skin Diseases in General Practice," respectively.

Silver Nitrate Not Being Used.—The Illinois State Department of Health calls attention to the fact that silver nitrate solution is not being used as contemplated by the law enacted last year requiring the use of this material in the eyes of all new-born children. The department furnishes this solution without cost. Four counties in the state have obtained no silver nitrate solution at all from the department this year, and nearly a dozen others have obtained only insignificant amounts.

Chicago

Dr. Lewis to Lecture at Rush.—Dr. Dean Lewis, professor of surgery, Johns Hopkins University School of Medicine, will deliver the third E. R. DeBoth Memorial Lecture at Rush Medical College, November 6, at noon. His subject will be "The Story of the Hypophysis."

Personal.—Dr. Aaron Arkin has been promoted to associate clinical professor of medicine at Rush Medical College. ——Prof. David Adlersberg of the University of Vienna lectured at Mount Sinai Hospital, October 22, and at the Cook County Graduate School of Medicine, October 23, on "The Dietetic Management of Diabetes."

Lay Educational Program.—The Chicago Medical Society will sponsor a lay educational program, November 14, in the auditorium of the Medical and Dental Arts Building. Speakers will be Drs. Lloyd L. Arnold, professor of bacteriology and preventive medicine, University of Illinois College of Medicine, and Logan Clendening, clinical professor of medicine, University of Kansas School of Medicine. They will discuss "You and Your Germs."

Society News.—Speakers before the Chicago Neurological Society, October 18, were Drs. Paul C. Bucy and Arthur Earl Walker, Chicago, on "Congenital Dermal Sinuses"; Isidore Finkelman and William Mary Stephens, Elgin, Ill., "Dinitrophenol in Dementia Praecox," and Dr. Walker on "Encephalography in Children."——At a meeting of the McDonagh Society for Clinical Research, October 19, Dr. Arthur Trevenning Harris, Gary, Ind., spoke on "Colitis and Its Complications."——Dr. Fred J. Taussig, St. Louis, was the guest speaker before the Chicago Gynecological Society, October 19. Other speakers were Drs. Fred L. Adair and Morris Edward Davis on "Chronic Atrophic Dermatitis of the Vulva," and Carl Henry Davis, Milwaukee, "Use of the Colposcope in the Diagnosis of Cervical Lesions."——Dr. Joseph L. Miller will address the annual meeting of the Institute of Medicine, December 24, on "The Influence of Claude Bernard's Experimental Methods on Medicine."

INDIANA

Cancer Program.—Dr. Max Cutler, Chicago, will address a dinner meeting of the St. Joseph County Medical Society, South Bend, November 7, on "The More Recent Developments in the Treatment of Cancer by X-Rays and Radium." This lecture is one of a series sponsored by the society which opened October 2, when Dr. Marcus W. Lyon Jr., South Bend, spoke on "The History and Etiology of Cancer." Dr. Alfred S. Giordano, South Bend, discussed "The Rôle of the Pathologist in the Cancer Problem," October 18; Dr. Fred R. Clapp, South Bend, October 23, "Cancer of the Female Reproductive Organs," and Dr. James L. Wilson, South Bend, "Cancer of the Gastro-Intestinal Tract." Subsequent speakers, all of South Bend, will be:

Drs. Carroll C. Hyde and Louis A. Sandoz, November 13, on Cancer of the Genito-Urinary Tract and Skin Cancer.

Drs. Slocomb R. Edwards and John C. Boone, November 27, Cancer of the Eye and Cancer of the Ear, Nose and Throat.

Dr. George F. Green, December 11, Breast Tumors.

Dr. Robert B. Acker, December 18, Bone Tumors.

District Meetings.—The fifty-second semiannual meeting of the Eleventh Indiana Councilor District Medical Association was held at Logansport, October 17, at the Northern Indiana Hospital. Dr. Franklin G. Ebaugh, Denver, addressed the scientific session on "Psychotherapy in the General Practice of Medicine," and Dr. Lawrence H. Gilman, Indianapolis, "Meningitis." Entertainment in the evening included a banquet and minstrel show.——At a meeting of the Tenth District Medical Society in Gary, October 24, the following program was presented:

Dr. Claud R. G. Forrester, clinical professor of surgery, Loyola University School of Medicine, Chicago, Reduction of Fractures Under Local Anesthesia with Ambulatory Treatment.

Dr. Austin A. Hayden, Secretary, Board of Trustees, American Medical Association, Chicago, What the Socialization of Medicine Means to the General Practitioner.

Dr. Russell L. Cecil, professor of clinical medicine, Cornell University College of Medicine, New York, Pneumonia.

Dr. Robert Sonnenschein, assistant clinical professor of laryngology and otology, Rush Medical College, Chicago, Practical Points of Otolaryngology for the General Practitioner.

State Medical Meeting and Election.—Dr. Roscoe L. Sensenich, South Bend, was chosen president-elect of the Indiana State Medical Association at its annual meeting in Indianapolis, October 9-11. Dr. Walter J. Leach, New Albany, the incoming president, will take over his duties January 1, succeeding Dr. Everett E. Padgett, Indianapolis. The next annual meeting will be held in Gary. Speakers at the meeting included the following physicians:

David W. MacKenzie, clinical professor of urology, McGill University Faculty of Medicine, Montreal, Quebec, Mechanical Factors in Renal Infections.

Isidor S. Ravdin, professor of surgical research, University of Pennsylvania School of Medicine, Philadelphia, Problems of Acute Appendicitis.

Robert A. Strong, professor of pediatrics, Tulane University of Louisiana School of Medicine, New Orleans, Erythroblastic Anemia of Childhood.

Emil Novak, associate in gynecology, Johns Hopkins University School of Medicine, Baltimore, Endocrine Aspects of Gynecology.

Lucius E. Burch, professor of clinical gynecology and obstetrics, Vanderbilt University School of Medicine, Nashville, Tenn., Diagnosis and Treatment of Uterine Bleeding.

Walter M. Simpson, director, diagnostic laboratories, Miami Valley Hospital, Dayton, Ohio, Undulant Fever.

Ralph A. Fenton, clinical professor and head of the department of otolaryngology, University of Oregon Medical School, Portland, Modern Views About Nasal Infections.

George R. Minot, professor of medicine, Harvard Medical School, Boston, Some Aspects of Anemia.

Sir Frederick G. Banting, professor of medical research, University of Toronto Faculty of Medicine, Toronto, Silicosis.

Frank H. Lahey, Boston, Diagnosis and Management of Thyroid States.

Dr. James S. McLester, Birmingham, Ala., President-Elect, American Medical Association, made an address at the annual banquet on "Borderline States of Nutritional Failure."

IOWA

Annual Clinic.—The University of Iowa College of Medicine will hold its twenty-third annual clinic in Iowa City, November 9-10. In addition to the various clinics, case presentations and laboratory demonstrations, there will be a dinner and social hour Friday evening, November 9. Dr. Logan Clendening, Kansas City, Mo., will be the speaker and discuss "Medical Subjects in Classical Art." The Purdue-Iowa football game, Saturday afternoon, will be an added attraction.

Society News.—The Bremer County Medical Society devoted its meeting in Waverly, September 20, to a symposium on socialized medicine. The speakers were Drs. Charles H. Graening, Waverly; Edward M. Myers, Boone; Merlyn B. Call, Greene, and John H. Henkin, Sioux City.——Dr. Ray A. Fox, Charles City, addressed the Buchanan County Medical Society in Independence, September 13, on "Treatment of Varicose Veins and Hemorrhoids by the Injection Method."——The proposed basic science law was considered by Drs. Fred Moore, Des Moines, and Ransom D. Bernard, Clarion, before the Calhoun County Medical Society at Lohrville, September 11.——Speakers at the eighty-first anniversary meeting of the Dubuque County Medical Society, September 11, included Drs. Porter P. Vinson, Rochester, Minn., on "Bronchoscopic Diagnosis and Treatment of Lung Conditions"; Frederick A. Figi, Rochester, Minn., "Fractures of Nose, Jaws and Other Facial Bones," and Leo G. Rigler, Minneapolis, "Early Diagnosis of Cancer."——Dr. Jay Arthur Myers, Minneapolis, addressed the Wapello County Medical Society in Wapello, October 16, on "Diagnosis, Treatment and Prevention of Tuberculosis."——Dr. Robert A. Strong, New Orleans, will address the Linn County Medical Society, November 30, in Cedar Rapids, on "Treatment of Empyema in Children."

MAINE

Examination of Food Handlers Discontinued.—The advisory council of the state department of health and welfare rescinded the regulations relating to the examination of food handlers, September 26. According to the state medical journal, other clauses in the regulations fully take care of this problem. This action is in line with a similar plan announced by the New York City Department of Health, which in the future will stress the personal hygiene of food handlers and the entire matter of food sanitation. The health commissioner of New York stated that the cost of examination of food handlers is enormously out of proportion to the returns yielded to the people of the city.

MASSACHUSETTS

Dr. Burwell Gives Cutter Lecture.—Dr. Charles Sidney Burwell, professor of medicine, Vanderbilt University School of Medicine, Nashville, Tenn., will deliver the Cutter Lecture on Preventive Medicine at Harvard Medical School, Boston, November 8. His subject will be "The Prevention or Postponement of Death from Heart Failure."

Tribute to Dr. Cushing.—A life size relief in bronze of Dr. Harvey Cushing, formerly Moseley professor of surgery at Harvard University Medical School, will be presented to the medical school in November by a group of pupils, friends and associates. A bronze medallion in reduction of the original is available for those who wish a memento. The original medallion has been purchased by the Boston Museum of Fine Arts. Both the medallion and the bronze relief are the work of Paul Adrian Brodeur, Wellesley Hills. Dr. Cushing is at present Sterling professor of neurology at Yale University School of Medicine, New Haven.

Mental Hygiene Survey of Teachers' Colleges.—Nine state teachers' colleges in Massachusetts were studied in a survey conducted over a two year period by Dr. Henry B. Elkind, medical director of the Massachusetts Society for Mental Hygiene, at the request of the commissioner of education and the presidents of the colleges. Its objectives were to ascertain the extent and method of teaching mental hygiene, to learn whether the pedagogy taught maintains a mental hygiene point of view, to ascertain what is being done for the mental health of the student-teachers and for their personal development, and to offer recommendations leading to improvements of curriculum or of personnel policies. The survey was limited to a consideration of the teaching of education, educational psychology, testing, hygiene and physical and health education. The practice or training school of each college was especially observed. It was recommended, among other things, that the courses in educational psychology should be modified to include more mental hygiene content and that mental and educational tests should be given a larger place in the curriculum.

MINNESOTA

Personal.—Dr. Charles Dexter Lufkin, Northfield, has been named assistant professor of health and physical education for men and physician in the college health service at Carleton College.

Society News.—Speakers before the Scott-Carver County Medical Society at Montgomery, September 11, were Drs. Walter A. Fansler, Minneapolis, on "Treatment of Hemorrhoids," and Myron O. Henry, Minneapolis, "Complications of Elbow Fractures."——At a meeting of the Hennepin County Medical Society, September 25, speakers were Drs. Chauncey

A. McKinlay, on "Dinitrophenol in the Treatment of Obesity," and Willis H. Thompson, "Influence of Certain Salts on Glucose Metabolism and Blood Pressure in Young Diabetics."——At a meeting of the Minnesota Academy of Medicine, October 10, Drs. Samuel E. Sweitzer and Carl W. Laymon, Minneapolis, discussed "Multiple Areas of Cutaneous Gangrene Following Scarlet Fever," and Waltman Walters and Gerald T. Church, Rochester, "Gastritis, a Phenomenon of Pyloric Obstruction, and Its Relation to Duodenal Ulcer."

MISSOURI

Personal.—The Southwestern Branch of the American Urological Association dedicated the program of its fourteenth annual meeting in St. Louis, October 22-24, to Dr. Bransford Lewis, St. Louis, in honor of his fiftieth year in the practice of urology. A formal banquet was also held in his honor. A graduate of Missouri Medical College, 1884, Dr. Lewis is emeritus professor of urology at St. Louis University School of Medicine.

Midwife's License Again Revoked.—The license of Mrs. Mary Ann Elizabeth Murphy, St. Louis, to practice midwifery was revoked by the state board of health, September 13, on charges of "dishonest and unprofessional conduct," newspapers reported. It was the first time the board has heard charges against a midwife since 1906; in that year Mrs. Murphy's license was revoked on charges of sending obscene matter through the mails. However, her license was restored in 1917. According to the reports, the complaint specifically charged Mrs. Murphy with conducting a maternity home without a license; with performing four illegal operations, and with failure to file a birth certificate within ten days after a birth.

Society News.—Members of the staff of the University of Missouri School of Medicine, Columbia, offered the program of the St. Louis Medical Society at its meeting, October 16: Drs. Dan G. Stine, professor of medicine, spoke on "The Prognostic Value of Leukocyte Counts in Pulmonary Tuberculosis"; Milton D. Overholser, associate professor and chairman, department of anatomy, "Recent Theories Concerning the Relationship of Hormones to Certain New Growths"; Claude R. Bruner, associate professor of ophthalmology and otology, "Present Status of Endoscopy," and Charles W. Greene, Ph.D., professor of physiology and pharmacology, "New Experimental Evidence of the Nerve Control of the Coronary Circulation and Its Significance in Clinical Cardiology."——At a meeting of the St. Louis Neuropsychiatric Society, October 22, Dr. Paul E. Kubitschek discussed "Reading Disabilities, Etiology, Complications and Treatment."——Dr. Edward A. Schumann, Philadelphia, will present a review of ectopic pregnancy before the Kansas City Academy of Medicine, November 16.——Speakers before the Jackson County Medical Society in Kansas City, October 9, were Drs. John L. Myers on physical therapy, and Vincent T. Williams on cardiac hazard of gallbladder surgery.

NEBRASKA

Society News.—Speakers at the meeting of the Omaha-Douglas County Medical Society, October 9, presented a symposium on the thyroid gland, as follows: Drs. Raymond L. Traynor, Maine C. Anderson, Augustus D. Cloyd, James F. Kelly and Nymphus F. Hicken.——Drs. Samuel F. Haines and Alfred W. Adson, Rochester, Minn., addressed the Elkhorn Valley Medical Society at Norfolk, August 24, on "Preoperative Preparation of Exophthalmic Goiter" and "Indications for and Results of Sympathectomy in the Treatment of Thrombo-Angiitis Obliterans," respectively.——Dr. John F. Allen, Omaha, addressed the Otoe County Medical Society, Syracuse, August 28, on recent advances in diagnosis of early tuberculosis.——Drs. Donald J. Wilson and Ernest L. MacQuiddy, Omaha, were the speakers at a meeting of the Madison Six Counties Medical Society at Wisner, September 18, on "Diagnosis and Treatment of Common Skin Diseases" and "Practical Aspects of Allergy," respectively.

NEW HAMPSHIRE

Sanitation of Lumber Camps.—The state board of health recently promulgated regulations designed to improve sanitary conditions in lumber camps. This action was the result of demands for unemployment relief in recent months, according to *Health*, the board's bulletin. The new regulations deal with such matters as proper location of camps, layout of buildings, construction of bunk houses, character and care of bedding to be provided, water supply, garbage and refuse disposal, location and construction of toilets, manure and wastes disposal, protection of public water supplies, sanitation of food handling, examination of food handlers and care of the sick.

NEW JERSEY

Allied Professions Conference.—Representatives of the Medical Society of the State of New Jersey, the New Jersey State Dental Society, the New Jersey Pharmaceutical Association and the New Jersey State Nurses' Association at a meeting, September 12, in the offices of the medical society in Trenton, perfected an organization to be known as the Conference of Allied Medical Professions of the State of New Jersey. The purpose of this society is to provide a medium for discussing matters of common interest to the various groups. It is planned to foster the organization of county and district groups. Meetings are to be held at least once a year and other meetings may be called by the chairman or by action of the conference.

NEW YORK

Society News.—Drs. Benjamin I. Ashe and Carl H. Greene, New York, addressed the Medical Society of Westchester County, October 16, on "Diagnosis and Treatment of Bright's Disease" and "The Modern Viewpoint of Diseases of the Biliary Tract," respectively.——Speakers before the Medical Society of the County of Albany, October 31, included Drs. Arthur F. Holding and Arthur M. Dickinson on "Need for Improved Technic in Tonsillectomy" and "The Schilling Hemogram: Its Value to the Surgeon," respectively.

New York City

Afternoon Lectures at the Academy.—The annual series of Friday afternoon lectures at the New York Academy of Medicine will begin November 9, with Dr. Arthur M. Fishberg as the speaker, on "Recognition and Treatment of Peripheral Circulatory Failure (Shock)." The remaining lectures for November and December will be as follows:

Dr. Arthur C. DeGraff, November 16, Therapeutic and Toxic Actions of Some Drugs Recently Introduced in the Treatment of Cardiac Disorders.

Dr. Edward M. Livingston, November 23, Signs and Symptoms in Abdominal Diagnosis.

Dr. Robert B. Osgood, Boston, December 7, Interpretation of Low Back Pain.

Dr. Charles G. Kerley, December 14, The Handicapped Child.

Dr. Walton Martin, December 21, The Significance of Excision in Treatment of Local Tuberculosis in Bones, Joints and Lymph Glands as Exemplified in the Treatment of Tuberculosis of the Thoracic Wall.

Dr. Henry G. Bugbee, December 28, Present Status of the Prostatic Problem.

Society News.—Drs. Soma Weiss, Boston, and William Lintz addressed the Medical Society of the County of Kings, October 16, on "Interpretation and Management of Syndromes Associated with Arterial Hypertension" and "Gastro-Intestinal Allergy," respectively.——Speakers before the Medical Society of the County of New York, October 29, were Drs. Arthur F. Chace and Eugene H. Pool, on medical and surgical aspects, respectively, of the diagnosis and treatment of peptic ulcer, and Fordyce B. St. John, on treatment of carcinoma of the stomach.——Drs. Madeline Penke, Corona, and Charles E. Farr presented a paper on "Meckel's Diverticulum" before the New York Surgical Society, October 24.——Dr. Leonard G. Rowntree, Philadelphia, addressed the New York Endocrinological Society, October 24, on "Diagnostic Criteria and Therapeutic Procedures in Diseases of the Adrenal Glands."——Drs. Thomas R. Brown and Theodore H. Morrison, Baltimore, addressed the National Society for the Advancement of Gastro-Enterology, October 24, on "Digestive Symptoms in Diseases Elsewhere" and "Idiopathic Ulcerative Colitis," respectively.——Drs. Isaias A. Lehman and Harry Gordon addressed the Bronx Gynecological and Obstetrical Society, October 22, on "Evaluation of Results of Electrosurgical Treatment of Chronic Endocervicitis."

OHIO

Society News.—Dr. Harry H. McClellan, Dayton, addressed the Hardin County Medical Society, September 20, on "Physical Causes of Mental Diseases."——Drs. Charles E. Turner, Columbus, and Robert W. Lukens, Wheeling, W. Va., addressed the Fayette County Medical Society, Washington Court House, September 6, on "Obstetric Hemorrhages" and "Early Diagnosis of Pregnancy," respectively.——Dr. William W. Weis, Piqua, presented a paper on "The Maggot Treatment of Suppurating Wounds and Osteomyelitis" before the Miami County Medical Society, Troy, September 7.——Dr. Roy W. Scott, Cleveland, was guest speaker at the first fall meeting of the Marion Academy of Medicine, September 4, on "Problems of Heart Disease from the Practitioners' Standpoint."——Dr. Maxwell Harbin, Cleveland, addressed the Stark

County Medical Society, September 11, on management of fractures.——Dr. Carl S. Bickel, Wheeling, W. Va., addressed the Belmont County Medical Society, Bellaire, September 6, on "Toxemias of Pregnancy."——Dr. Robert H. Crawford, Indianapolis, addressed the Toledo Academy of Medicine, October 5, on "Relation of Cell Size to the Classification of Some Commonly Encountered Anemias."——Dr. Norris W. Gillette, Toledo, addressed the Academy of Medicine of Lima and Allen County in Lima, September 18, on "Abdominal Surgery in Children."

PENNSYLVANIA

Record Low Birth Rate.—Health department statisticians have announced a total of 157,059 live births in Pennsylvania during 1933, a rate of 15.8 per thousand of population. Both the actual number and the rate established low records. The birth rate has declined steadily since 1921, when it was 25.9. Last year 96 per cent of all live births were attended by physicians, 3 per cent by midwives, and 1 per cent by persons other than a doctor or midwife.

The Furlough Plan at Sanatoriums.—The state department of health has recently announced a furlough plan for the three state tuberculosis sanatoriums, with a view to decreasing the waiting list, which now numbers more than a thousand. Patients who are successfully receiving artificial pneumothorax treatment are to be returned to their homes and will receive treatment at special clinics. Field nurses and clinicians will watch these patients carefully and return to the sanatorium any who do not show sufficient improvement.

Philadelphia

Meeting on Ophthalmia Neonatorum.—A report on a survey of 27,000 hospital birth records and 2,000 cases of ophthalmia neonatorum made to determine the limitation in the use of silver nitrate was presented by Dr. Louis Lehrfeld at the regular meeting of the Philadelphia County Medical Society, October 24. Dr. Lehrfeld's study was undertaken under the sponsorship of the Philadelphia Committee on the Conservation of Vision, a similar committee of the Medical Society of the State of Pennsylvania, the Philadelphia Department of Public Health and the Philadelphia Health League. It was financed by funds supplied by the Civil Works Administration. Mr. Lewis H. Carris, New York, managing director of the National Society for the Prevention of Blindness, and Drs. J. Norman Henry, George E. de Schweinitz, Barton Cooke Hirst and William R. Nicholson discussed the subject.

RHODE ISLAND

Hospital News.—Drs. William B. Castle and Maurice B. Strauss, Boston, presented papers at a meeting at the Rhode Island State Hospital for Mental Diseases, Howard, October 23, on "Practical Treatment of Anemia" and "Polyneuritis, Spinal Cord Sclerosis and Korsakoff's Syndrome," respectively.

Society News.—Dr. Emanuel A. Henkle, New London, Conn., addressed the Washington County Medical Association, Westerly, October 10, on obstetric problems.——Dr. William Jason Mixter, Boston, addressed the Providence Medical Association, October 1, on "Rupture of Intervertebral Disk as a Clinical Entity."

TENNESSEE

Personal.—Dr. Andrew Richard Bliss Jr., formerly chief of the division of pharmacology of the University of Tennessee College of Medicine, has been appointed professor of pharmacology and to the newly created office of dean of pharmacy at Howard College, Birmingham, Ala., *Science* reports.

Society News.—Drs. Edward A. Oliver, Chicago, and Charles A. Aldrich, Winnetka, Ill., addressed the Gibson County Medical Society, September 24, on diseases of the skin and diseases of children, respectively.——Dr. Tinsley R. Harrison, Nashville, was guest speaker at a meeting of the Madison County Medical Society, Jackson, October 2, on "Treatment of Congestive Heart Failure."——Dr. William D. Haggard, Nashville, addressed the Sullivan-Johnson Counties Medical Society, Kingsport, September 5, on cancer of the colon.——Drs. William W. Wilkerson Jr. and Murray B. Davis, Nashville, discussed eye injuries and abdominal injuries, respectively, as guest speakers before the Robertson County Medical Society, Springfield, in August.——Drs. Edward G. Thompson and John J. Shea addressed the Memphis and Shelby County Medical Society, Memphis, September 4, on "Problems of the Obese" and "Management of Fractures of the Face," respectively.

VIRGINIA

Society News.—Dr. James P. Baker Jr., Richmond, addressed the Southside Virginia Medical Association, September 11, on cardiac asthma. Drs. Dean B. Cole, Frank S. Johns, Richmond, and John A. Proffitt, Burkeville, demonstrated collapse therapy of tuberculosis.——Speakers at a meeting of the Mid-Tidewater Medical Society at Gloucester, July 24, were three Richmond physicians: Drs. Lawrence T. Price, on hematuria; Reuben F. Simms, granuloma inguinale, and Frank S. Johns, surgical gynecology.

State Medical Election.—Dr. Philip S. Moncure, Norfolk, was chosen president-elect of the Medical Society of Virginia at its annual meeting in Alexandria, October 11. Drs. Carrington Williams, Richmond, Samuel B. Moore, Alexandria, and Alexander F. Robertson Jr., Staunton, were elected vice presidents and Miss Agnes V. Edwards, Richmond, was renamed executive secretary. Dr. Francis H. Smith, Abingdon, was installed as president for the coming year. Next year's meeting will be held in Norfolk.

WISCONSIN

Personal.—Dr. George R. Love, Oconomowoc, won the president's cup in the annual golf tournament of the State Medical Society of Wisconsin in Green Bay, in September, with a score of 75.——Dr. Roy T. Hansen has been chosen health officer of Wauwautosa to succeed Dr. Enoch F. Peterson.

Society News.—Drs. Robert S. Baldwin, Marshfield, and Stephen E. Williams, Chippewa Falls, addressed the Clark County Medical Society, September 5, on tuberculous meningitis and anesthesia, respectively.——Dr. Chester M. Kurtz, Madison, presented a paper on "The Physician's Heart" at a meeting of the Dane County Medical Society, Stoughton, September 20.——Speakers before the Tenth District Medical Society at Eau Claire, September 27, were Drs. Alfred A. Strauss, Chicago, on "Surgical Treatment of Gastric and Duodenal Ulcers"; William T. Peyton, Minneapolis, "Diagnosis and Treatment of Malignancy," and William D. Stovall, Madison, "Prophylactic Immunization."——Dr. William P. Murphy, Boston, addressed the University of Wisconsin Medical Society, Madison, September 28, on "The Present Status of Pernicious Anemia."

GENERAL

Society News.—The American Association of School Physicians has established new headquarters at 883 Broadway, Albany, N. Y. Dr. William A. Howe, Albany, secretary of the association, will henceforth devote most of his time to its affairs. Dr. Charles H. Keene, Buffalo, N. Y., is the present president of the association, installed at its recent meeting in Pasadena, Calif.——Dr. John M. Wheeler, New York, was elected president of the Society of Plastic and Reconstructive Surgery at its recent annual meeting in New York; Drs. Warren B. Davis, Philadelphia, and Isadore Goldstein, New York, were elected vice presidents, and Dr. Arthur Palmer, New York, general secretary.——Dr. Robin C. Buerki, Madison, Wis., was named president-elect of the American Hospital Association at its annual session in Philadelphia, and Mr. Robert Jolly, Houston, Texas, was installed as president.

Bequests and Donations.—The following bequests and donations have recently been announced:

Jewish Hospital, Philadelphia, $5,000 by the will of Dr. Edwin A. Jarecki, former chief resident physician of the hospital.

New York Hospital, New York, $100,000 by the will of Edward Wright Sheldon, late president of the hospital.

Montefiore and Mount Sinai hospitals, New York Tuberculosis and Health Association and American Red Cross, New York, $1,000 each by the will of the late Minnie Dessauer.

Hospital for Joint Diseases, New York, $100,000 by the will of the late Edward W. Browning.

St. Mary's Free Hospital for Children, $8,000 by the will of Fannie Henrietta Youngs.

Methodist Hospital and James Whitcomb Riley Hospital, Indianapolis, $100,000 and $50,000, respectively, by the will of the late Louis H. Levey.

New York Homeopathic Medical College and Flower Hospital, $50,000 from the estate of the late Dr. John E. L. Davis, made available through the death of Mrs. Davis.

Research on Leprosy.—During the current year the Leonard Wood Memorial for the Eradication of Leprosy has made grants for research in its special field to the following workers:

Dr. Charles M. Carpenter, University of Rochester (N. Y.) School of Medicine, for study of radiothermic treatment of leprosy.

Edmund V. Cowdry, Ph.D., Washington University School of Medicine, St. Louis, for study of histophysiology of lesions of leprosy by micro-incineration.

Dr. Esmond R. Long, University of Pennsylvania School of Medicine, Philadelphia, comparative study of acid-fast bacteria.

Dr. Clarence A. Mills, University of Cincinnati College of Medicine, survey of climate on the incidence of leprosy.

Malcolm H. Soule, LL.D., University of Michigan Medical School, Ann Arbor, Mich., methods of blood culture in tuberculosis and leprosy.

Support of the memorial laboratory completed last year in Culion, P. I., was continued and additional facilities were provided for the Eversley Childs Treatment Station and the Cebu skin clinic built by the Wood memorial and presented to the Philippine Health Service. The memorial fund also supports the *International Journal of Leprosy*.

Hygiene Association Withdraws Sponsorship of Film.—The American Social Hygiene Association announces that it has withdrawn its sponsorship of the commercially produced film "Damaged Lives," which deals with syphilis in family life. Dr. William F. Snow, New York, general director of the association, states that apparently it has been impossible for the owner of the film, the Weldon Pictures Corporation, to control undesirable and unauthorized activities of distributors and exhibitors in the local advertising and showing of the film. The association has notified the firm that the name of the American Social Hygiene Association must be removed from the film and all prints therefrom and from all material used in connection with its showings and has requested the return of the negative and all prints of the lecture film dealing with syphilis, which was shown jointly with the picture. The executive committee believes that the experience, which was undertaken after consultation with health officers, physicians and educators, has been worth while and will possibly pave the way for entirely successful projects in the future. In his letter addressed to members and cooperating agencies, Dr. Snow states that although the films are not being scheduled for future showings, a number of copies have not been turned in and comments from one city indicate that it has been shown there with undesirable and unauthorized modifications of the approved program. He asks that the association be notified if these films are shown or announced in any community.

Southern Medical Association.—The twenty-eighth annual meeting of the Southern Medical Association will be held in San Antonio, Texas, November 13-16, under the presidency of Dr. Hugh Leslie Moore, Dallas. The speakers at the general sessions will be as follows:

Dr. Robert U. Patterson, Surgeon General, M. C., U. S. Army, Washington, D. C., Military Training of Medical Officers, Regular, Reserve and National Guard.
Dr. Frank K. Boland, Atlanta, Interpretation of Abdominal Pain.
Dr. Joseph L. Baer, Chicago, Some Phases of the Conduct of Labor.
Dr. Miley B. Wesson, San Francisco, Urography and the General Practitioner.
Dr. William T. Coughlin, St. Louis, Surgical Relief of Pain About the Head.
Dr. George M. MacKee, New York, Treatment of Skin Diseases by Physical Therapeutic Methods.
Dr. William P. Wherry, Omaha, Chronic Sinusitis from a General Practitioner's Viewpoint.
Dr. Walter L. Bierring, Des Moines, Iowa, President, American Medical Association, Heart Disease and the General Practitioner.
Dr. Francisco de P. Miranda, Mexico City, Physiology of Heart Failure.
Dr. Bernard Myers, London, England, Reminiscences of Interesting Pediatric Clinical Cases.
Dr. Jacques Forestier, Aix-les-Bains, France, Relief of Pains of the Locomotor System by Means of Local Injections of Lipiodol and Their Control by X-Rays.
Dr. H. Kennon Dunham, Cincinnati, Pulmonary Emphysema, an Important Sequela of Chronic Lung Lesions.
Dr. James S. McLester, Birmingham, Ala., President-Elect, American Medical Association, Nutritional Failure as a Clinical Problem.
Dr. Albert H. Rowe, San Francisco, Food Allergy, a Common Problem in Practice.

Discoverers of Liver Treatment Share Nobel Prize.—Drs. George R. Minot and William P. Murphy of Harvard Medical School, Boston, and George H. Whipple of the University of Rochester, Rochester, N. Y., have been named winners of the Nobel Prize in medicine for 1934. The prize, which this year totals $41,000, was awarded to the three physicians "for liver therapy in anemia." Dr. Minot, who is 49 years of age, graduated from Harvard in 1912. During his career he has been associated with Johns Hopkins University School of Medicine and various institutions affiliated with Harvard, where, since 1928, he has been professor of medicine. In 1928 he was awarded the Kober gold medal of the Association of American Physicians and the Charles Mickle fellowship of the University of Toronto; in 1930, the Cameron prize of the University of Edinburgh and the gold medal of the National Institute of Social Sciences; and in 1931 shared with Dr. Whipple the gold medal and $10,000 award of *Popular Science Monthly*. Dr. Whipple graduated in medicine at Johns Hopkins University in 1905. He is 56 years of age. In 1914 he left Johns Hopkins, where he had been a member of the faculty since 1909, to become professor of research medicine at the University of California and director of the Hooper Foundation for Medical Research, San Francisco. He was dean of the medical school from 1920 to 1921, when he was appointed dean and professor of pathology of the University of Rochester School of Medicine and Dentistry, Rochester, N. Y., his present position. Dr. Murphy is 42 years of age and an alumnus of Harvard, where he is now instructor in medicine. In 1930 he shared the Cameron Prize with Dr. Minot.

Rockefeller Foundation Aids Research in Mental Health.—The major emphasis of the activities of the Rockefeller Foundation in 1933 in the field of medical science was placed on the problem of mental health. Of a total of $9,890,806.31 expended by the foundation for philanthropic projects, $1,173,853 was appropriated for the advancement of medical science. Programs concentrating specifically on psychiatry and public health teaching were aided at Johns Hopkins University School of Medicine for research in psychiatry; University College, London, for work in biophysics and neurophysiology; Washington University, St. Louis, for investigations in nerve physiology, and Harvard Medical School and Massachusetts General Hospital for cooperative work in psychiatry. In addition Dalhousie University, Halifax, N. S., received an appropriation for development of teaching in public health. During 1933 the foundation provided 295 fellowships in the medical sciences and by research grants enabled sixty-one scientists or groups of scientists to carry on research. For public health work during the year the foundation expended $3,286,063.01. Projects for the control of yellow fever were supported in Africa, Brazil, Bolivia and New York; malaria control in three states of the United States and seventeen foreign countries; studies of hookworm disease in Palestine, Egypt, Straits Settlements and Puerto Rico; studies of Endamoeba histolytica, Rocky Mountain spotted fever, tuberculosis, sprue anemia, filariasis, schistosomiasis, and the diseases affecting the races of the Pacific. Among other activities the foundation also aided the government of India in conducting experiments on the disposal of refuse; sponsored studies of statistical epidemiology; contributed to development of health service in many foreign countries, as well as in various areas in the United States; contributed to the support of schools of hygiene and public health and centers of training in Japan, Puerto Rico, Central America, South America, Europe and the United States. Appropriations in the field of the natural sciences included funds to the National Research Council for research in problems of sex and the effects of radiation on living organisms and to the Roscoe B. Jackson Memorial Laboratory in Bar Harbor, Maine, for research in mammalian genetics. The remainder of the year's appropriations were placed in the fields of social sciences and the humanities and in emergency grants, the last including funds contributed to both American and European universities for salaries of scholars displaced from their positions in foreign schools for political reasons.

Government Services

Medical Director Appointed for F E R A

Dr. Clifford E. Waller, assistant surgeon general in charge of the states relations division of the U. S. Public Health Service, has been appointed medical director for the Federal Emergency Relief Administration. Dr. Waller will direct the policies and activities of the administration in the field of medical relief for the unemployed and advise the various divisions on health and sanitation matters. He will also advise in the development of work-relief activities that promote health, such as the malaria control projects and nursing work. He will continue to devote part of his time to his work with the public health service.

Changes in Public Health Service

Passed Asst. Surg. Fred W. Kratz, relieved at Angel Island, Calif., and assigned at Portland, Ore., in charge of service activities at that place.

Medical Director Emil Krulish, relieved at Portland and assigned at Los Angeles, in charge of the relief station.

Asst. Surg. Ralph J. Mitchell, relieved at New Orleans Marine Hospital and assigned at Marine Hospital, San Francisco.

Passed Asst. Surg. Frank S. Fellows, relieved at Albuquerque, N. M., and assigned at the Marine Hospital, New Orleans.

Sr. Surg. Robert H. Heterick, relieved at Los Angeles and assigned at Albuquerque, N. M., for duty in connection with the supervision of administrative affairs in connection with the control of communicable diseases among the Indians.

Surg. William Y. Hollingsworth, relieved at Marine Hospital, New Orleans, and assigned at Louisville in charge of the Marine Hospital.

Surg. Frank V. Meriwether, relieved at Ellis Island, N. Y., and assigned at Oslo, Norway, for duty in the office of the American Consul for the examination of aliens.

Passed Asst. Surg. Ralph Gregg, relieved at Dublin, I. F. S., and assigned at Ellis Island, N. Y.

Asst. Surg. Alexander G. Gilliam, relieved at Los Angeles and assigned at the Marine Hospital, Seattle, Wash.

Surg. Walter G. Nelson, relieved at Oslo, Norway, and assigned at Dublin, for duty in the office of the American consul general, in connection with the examination of aliens.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct. 5, 1934.

The Health of the Nation

In the annual report for 1933 of the Chief Medical Officer of the Ministry of Health (Sir George Newman), the estimated population in England and Wales in the middle of the year is stated to have been 40,350,000.

THE DECLINING BIRTH AND DEATH RATES

The two great features of English vital statistics during the past half century are the considerable declines in the birth and death rates. In the decade 1871-1880 the annual birth rate averaged 35.4 per thousand persons living. A continuous fall then set in. In the decade 1921-1930 the rate was almost halved, being only 18.3. Moreover, the individual years throughout this decade, as well as those which have followed, have shown a rapid and almost continuous fall. In 1926 the birth rate was 17.8; in 1927, 16.6; in 1928, 16.7; in 1929, 16.3; in 1930, 16.3; in 1931, 15.8; in 1932, 15.3, and in 1933 (the year now under review) 14.4. The fall of the birth rate is such that statisticians have calculated that in 1940 the population will cease to increase and after that will decline.

As to the death rate, this averaged 21.4 in the decade 1871-1880. The great advances in hygiene have so reduced it that in the decade 1921-1930 it was only 12.1. In 1933 it was 12.3. The five principal causes of death gave the following figures per thousand deaths for 1933: diseases of the heart and circulatory system, 269; cancer, 124; respiratory diseases, 113; diseases of the nervous system, 79; tuberculosis, 67. The infant mortality has also shown a great decline. In the quinquennium 1871-1875 the deaths of infants under 1 year averaged 153 per thousand live births; in 1930 the figure was only 60, the lowest on record; in 1933 it was 64.

INFECTIOUS DISEASES

The decline in the mortality of the infectious diseases in the last thirty years is remarkable. The typhoid death rate fell from 174 per million persons in 1900 to 6 in 1932. For ages under 19 years the measles death rate, calculated in the same way, showed a fall from 1,199 to 455; the scarlet fever, from 340 to 46; the diphtheria, from 936 to 229, and the whooping cough from 1,090 to 310. But incidence has not always kept pace with mortality. The annual number of cases of diphtheria has been practically constant for twenty years.

TUBERCULOSIS

In 1933 there were 33,259 deaths from tuberculosis, against 33,658 in 1932. In the decade 1871-1880 the average annual death rate from tuberculosis per thousand of population was 2.88; in that of 1881-1890, 2.43; 1891-1900, 2.02; 1901-1910, 1.66; 1911-1920, 1.43, and 1921-1930, 1.01. In curious contrast to this general fall, however, a rise in the death rate of single young women (aged from 15 to 25 years) became apparent in 1917 and the subsequent years and was most marked in London. The report states that the causes of this increase have never been definitely ascertained. The increase in the number of women employed in industry, with the fatigue consequent on the nature of the employment and the journeys to and from home in overcrowded trains, buses and trams, want of rest and late going to bed after dancing and other amusements have been suggested as causes; also unsatisfactory meals, such as the "tea and bun" lunch.

VENEREAL DISEASES

The official scheme for the treatment of venereal diseases has been in operation for eighteen years. Its principles are the education of the public in the danger of these diseases and the provision of centers for their treatment. In the treatment of syphilis considerable success has been attained. The greater number of persons infected resort to the centers. The new cases treated there amounted to 42,805 in 1920. In 1924 they fell to 22,010 and in 1933 to 21,525, the lowest number on record. Syphilis is not now transmitted to wives and offspring to the same extent as in the past.

CANCER

The deaths per million of population from cancer were 1,526 in 1933, an increase of 16 over 1932. The increase of cancer is shown by the following figures: In the quinquennium 1901-1905 the crude death rate from cancer per million was 867; in 1926-1930, 1,411. The increase in the crude death rate is attributed to the average lengthening of life of the population. Sir George Newman considers that there is a changing outlook in cancer prevention. When cancer became a subject of experimental research it was thought that some method of causation would be discovered which would indicate a road to prevention. It is now thought that the changes in the cells which have undergone malignant transformation are no more than pathologic, perhaps even physiologic, reactions to one or more of a wide variety of stimuli, more or less peculiar to the different organs affected. The need is for minute investigation of the abnormal conditions which determine the emergence of cancer, conditions which probably differ widely for different organs. There is a feeling of growing dissatisfaction with the results of laboratory research, and it is suggested that in the future attention will be turned to clinical research.

Nutrition and the Industrial Depression

The evidence collected indicates that the general health of the population is well maintained in spite of economic difficulties. The health of the unemployed and their dependents, as a whole, is not suffering seriously or generally, though of course there are exceptions. Many of the unemployed in the distressed area show the inevitable physical signs of prolonged deprivation, though not deprivation comparable in degree with that of certain periods in the nineteenth century. There is no question that the nutrition of the English people today is better than that at any period of which there are records. So far as the death rate is any criterion, of the six English and Welsh counties most seriously affected by the industrial depression, two had a general death rate actually below the average for the country and in the others it was only slightly higher. But the infant death rate in nearly all these areas was above the national average.

Aerial Medical Service in Australia

In the sparsely settled parts of Central and Northern Australia, the aerial medical service of the Australian Inland Mission has proved a great boon. Recently a woman in a cattle station hundreds of miles from the nearest township was taken suddenly ill. Within thirty-six hours she had been taken 700 miles to a hospital at Camooweal. This feat was accomplished by the aid of wireless and airplane. When it became apparent that the illness was serious a girl motored 70 miles to another cattle station, which is equipped with one of the mission's pedal-transmitter wireless sets. These sets are an Australian invention and are so simple that no training is required to use them. A message describing the woman's illness was tapped out on a device like a typewritter, operated by pedals like those of a bicyle. As the operator spelled out each word it was converted into Morse by the machine and automatically transmitted by wireless telegraphy. The message was picked up at the mission's chief country center at Cloncurry, North Queensland. A few minutes later listeners at the cattle station heard the voice of the "flying doctor," Dr. J. M. Rossell, asking for more information about the woman.

This was again spelled out on the pedal-transmitter. An airplane with a pilot and the doctor on board left Cloncurry for the station where the woman was ill. On arriving the doctor attended to the patient, placed her on a stretcher in a special compartment of the airplane and flew with her to the hospital at Camooweal, where the operation was performed. The Australian Inland Mission has twenty wireless sets of the pedal-transmitter type at key positions in Northern Australia. This particular airplane has flown more than 100,000 miles for the mission without a serious accident, a remarkable performance considering that it mostly has to land on rough station paddocks.

PARIS

(From Our Regular Correspondent)

Oct. 8, 1934.

Suppression of a Burdensome Tax on Physicians

The French medical profession has just been given an important reduction in taxes. According to a law dating back to 1880, a physician was obliged to pay a relatively high percentage on his net income (after deduction of expenses incurred in the exercise of his profession).

There were two other taxes, one similar to the personal property tax in the United States, which amounted to about 25 per cent of the rental of his domicile, and a second more obnoxious form of taxation, termed the "patente," or privilege to practice, also based on the rental value of his domicile, which was equally burdensome, amounting to about 40 per cent of the rent paid. If a physician had an office in another building than that in which he resided, he was obliged to pay the "patente" a second time, and even a third time if he had a country home. The result has been that medical practitioners have been greatly handicapped, being obliged to adapt themselves to inadequate facilities in their domiciles.

These various taxes have left physicians but little of their hard-earned income and have been a discouragement to young men about to engage in practice. Fortunately, one of these taxes, the "patente," which does not exist in the United States, has just been suppressed, so that the burden has been considerably lightened.

In spite of their reputation for honesty and neglectful of the immense amount of services rendered gratuitously, the taxing powers do not trust French physicians. In order to keep a check on medical incomes, every practitioner is now obliged to keep a book giving the name of every patient treated, and the amount received from each one. In order to maintain professional secrecy, a patient can be given a number instead of being listed by name.

Rôle of the Filtrable Virus in Infantile Tuberculosis

At the French Pediatric Congress in July, Paisseau and Valtis read a paper on the rôle of the filtrable virus in infantile tuberculosis. The presence of a filtrable tuberculosis virus in the organs of both healthy children at birth and in guinea-pigs whose mothers were tuberculous is well established by the work of Calmette and others. The authors have obtained similar results by the inoculation of guinea-pigs with nonfiltered tuberculous material obtained from human beings. This raises the questions not only of whether heredity plays a part in tuberculosis, but also that of the part played by the filtrable virus in the pathogenesis of human tuberculosis.

The authors emphasize the necessity of protecting the healthy infant from being infected by a tuberculous mother or other member of the family, despite the apparent handicap which these investigations imply as to heredity and antepartum infection. Infection from those who are suffering from tuberculous lesions in close contact with children must still remain the most common source.

The studies made by these authors reveal the existence of a difference between reactions to tuberculin and to the filtrable ultravirus, which can perhaps be utilized to distinguish certain types of "inflammatory tuberculosis" in which the filtrable virus plays an important part.

One can isolate in cases of polyarticular rheumatism, nephritis, purpuras and other diseases, both in adults and in children, acid-fast bacilli that present most of the characteristics of the elements obtained from the filtrable virus. This permits one to make the deduction that in these diseases there is a pathogenic action by the filtrable elements of the tubercle bacillus.

The missing link in the chain of evidence of the relation between so-called inflammatory tuberculous diseases and tuberculosis as it has been accepted up to the present time is that in the former group one does not find the lesions which, since Poncet, have been regarded as typical of infection by the tubercle bacillus. Views on the results of guinea-pig inoculation with tuberculous products from the human being must be modified. In the future, the absence of typical tuberculous lesions in the inoculated guinea-pig does not imply the nonexistence of tubercle bacilli in the secretion, excretion or tissue from which the inoculated material was taken.

Ribadeau-Dumas, in the discussion of this paper, stated that a maternal tuberculosis did not seem to have much influence on healthy new-born infants, and the impregnation of the human organism by the filtrable tuberculosis virus could not be regarded as much of a menace.

Paisseau, in closing, drew attention to the fact that there still exist many anomalous factors in the question of research on the subject of tuberculosis. There may be some other still unsolved question than that of the filtrable ultravirus. If the bacillus and the tubercle are not constantly associated, one fails to see why the virulence of the bacillus should be the sole invariable factor.

Commemoration of the Services of the American Ambulance of Neuilly During the World War

In the presence of American and French officials, a tablet has just been placed in the Neuilly high school building, which was used as a hospital by the first ambulance corps to be placed in service during the World War. Less than a month after the declaration of war, the organization was ready to convey the wounded to Paris. About 250 physicians and surgeons and 650 civilians of both sexes devoted their energies to the care of the wounded in this hospital. From Sept. 1, 1914, to July 1917, more than 12,000 French soldiers were cared for. After the United States entered the war, a large number of American soldiers were cared for in the building and it became a part of the army medical service.

Coexistence of Hyperthyroidism and Hyperpituitarism

At the July 10 meeting of the Academy of Medicine, Drs. Etienne and Drouet said that the reason failures occur in the treatment of hyperthyroidism is the inability to appreciate the fact that there is an alteration in the function of the hypophysis as an associated lesion. The fact that the basal metabolic rate is lowered by simple irradiation of the hypophysis proves that the hyperactivity of this gland dominates hyperthyroidism. Under these conditions, one ought not to limit the treatment of hyperthyroidism to radiotherapy, administration of iodine or thyroidectomy. It is essential to treat the excessive activity of the hypophysis at the same time by radiotherapy of this structure.

Radiotherapy of Furuncles of Upper Lip

Dr. Faure and his associates report excellent results following the use of radiotherapy in this grave localization of pyogenic organisms. Surgeons feel that operative measures are often of no avail in preventing intracranial complications of furuncles

of the upper lip and hence the authors feel that their success in six cases merits the application of radiotherapy. The rapid improvement (after a few days) was striking. They cite the statistics of Baensch, who treated 109 furuncles of the face (twenty-one of the upper lip and twenty-four of the nose) with a mortality of only 1.9 per cent following the use of radiotherapy alone. In the fatal cases there were already symptoms of thrombosis of the cavernous sinus at the time treatment was begun. In 103 cases treated surgically at an adjacent clinic there was a mortality of 10.3 per cent.

Renal Intolerance of the Type of Lipoid Nephrosis Following Treatment for Syphilis

At a recent meeting, Dr. Tzank and his associates reported two cases of lipoid nephrosis following the administration of small doses of antisyphilitic drugs. The same observations have been reported after the use of gold salts in pulmonary tuberculosis and after serotherapy. The authors believe that there is a type of renal intolerance which presents clinically the symptoms of a lipoid nephrosis. This corroborates the opinion held in France as to this form of nephrosis; viz., that it is a clinical syndrome the etiology and character of which depend on a number of different pathologic lesions.

Death of Prof. Léon Bernard

One of the leaders in the international fight against tuberculosis has just died of cerebral hemorrhage. He was one of the first to create a special service in public hospitals for the treatment of pulmonary tuberculosis. This new ward service and the outpatient department were under his constant supervision. They served as models for the remarkable organization that now exists in all parts of France and its colonies, in the form of services in city hospitals, dispensaries and sanatoriums, all well coordinated to combat a disease that is prevalent in France. Léon Bernard also played an important part in the organization of the International Congress on Tuberculosis and was for a time its secretary general.

BERLIN

(From Our Regular Correspondent)

Sept. 3, 1934.

The Causes of the Heavy Mortality of Male Fetuses

Professor von Pfaundler, pediatrician, of Munich, delivered an address recently on "The Causes and the Significance of the Heavy Mortality of Male Fetuses." By "early death" is meant deaths that occur before the end of the first year of life, including also the prenatal deaths. The so-called stillbirths occur between the eighth and the tenth month of pregnancy (about 30,000 in Germany), while the miscarriages occur during the first seven months of pregnancy. Reliable statistics are not available, particularly in regard to the miscarriages of the first few months. One can, however, make an estimate. From statistics that included no wilful abortions, Pfaundler estimated that there are 280 miscarriages for each thousand births. Of 2,010,000 conceptions annually, 910,000 reach the first year of life. Fetal deaths are, therefore, much more frequent than is supposed. Since greater importance attaches to the quality of offspring than to the quantity, the question arises what values are lost. Is this high mortality a weeding-out process of nature? In comparisons with animals, it has been found that in pigs there are 28 abortions to 100 conceptions; in rats, 33 abortions, and in man, 22 abortions. Of the human procreations, 45 per cent die before they reach the procreative stage. In all animals and plants the proportions are less favorable. In illustration, it was stated that the female sturgeon deposits several million eggs, all of which are impregnated. If only one million survived and matured and reproduced, in the third generation the sturgeon spawn would be unable to find sufficient room on earth, and in the fourth generation sturgeon spawn would exceed in mass the earth itself; hence the early death of multitudes is here an absolute necessity.

The pathologist can shed light on the cause of fetal deaths. According to these observations, eighty out of a hundred pregnancies end with birth; of the remaining twenty, seven are abortions; one is a monster; the twelve fully developed fetuses are not always normal; in fact, most of them show abnormalities that may be regarded as the consequences of actual malformations. Malformations are regarded as of hereditary origin. Among the miscarriages there are more males than females, the percentage of males becoming relatively greater the nearer the deaths lie, in point of time, to the conception period. By applying extrapolation methods it may be computed that 146 males are conceived as against 100 female individuals. The mortality among the females is slight, being about the same as in infants. With the males it is different; for, by the end of the first month after conception, 200 out of a thousand have perished. The higher death rate of one sex is well known, a genotypic illustration being the fact that only men die from the effects of hemophilia. In the opinion of Lenz, the deaths among the male embryos are conditioned by recessive, sex-bound lethal factors. These causes can cause damage only in the genotype, this being associated with the composition of the twenty-fourth chromosome; that is to say, lethal factors and hereditary units, which, with external manifestations not understood in detail, lead to an early death of the individual. According to this conception, the higher mortality among the male embryos would effect a wholesale elimination of recessive lethal factors. These views appear to harmonize with the known figures.

The deaths occurring at term or thereabouts are associated, for the most part, with injuries in the mother, so that probably here also selective processes are at work. It is highly probable that the defects of the mother find expression in the genotype of the child. Likewise during the birth period the percentage of male deaths is relatively higher. Aside from the fact that the head of males is larger than that of females, Pfaundler thinks that also a sublethal factor is involved, since the excess mortality observed in males holds good still in the group delivered by cesarean section. The male sex is, in point of fact, the weaker, with its forty-seven nuclear fibers as against forty-eight in females. More boys die from all possible diseases, including constitutional diseases, as is revealed by the statistics of the German reich. Pertussis alone constitutes an exception, for the incidence and the mortality of this disease are higher among females. The reasons for this fact are not understood.

Influence of the Weather on Eye Diseases

It has been shown by Professor de Rudder that disturbing layers of the atmosphere that appear at the junction of two bodies of air play a part in the origin of so-called weather diseases. The presence of such a layer can be ascertaind by the weather bureaus by observations on the barometer, the temperature, cloud formation and the amount of precipitation. Of the eye disorders caused by the weather, acute attacks of glaucoma are well known. Dr. Rohrschneider of Greifswald points out that research has shown that many cases of herpes corneae present all the characteristics of a weather disease. The weather is the nonspecific cause of the disease manifestation, its effects being brought about by modification of the reactivity of the vegetative nervous system; in addition there is of course also a specific cause.

Distinct from the weather diseases are the "seasonal diseases." The precipitating factor in the seasonal diseases has not yet been ascertained. For example, ulcus serpens in Greifswald (Pomerania) shows a peak at harvest time, in July and August.

An example of a genuine seasonal disease, with a summer peak, is conjunctivitis induced by diplobacilli, with its peak in June and July. The scrofulous diseases of the eye give evidence of a regular increased incidence in spring, with the peak falling in March.

Dr. Ortmann, of the Pathologic Institute of the University of Berlin, recently endeavored to discover whether the weather plays a part in the causation of death. It was not possible to demonstrate a distinct dependence of the mortality figures on atmospheric pressure, temperature, vapor tension, humidity, direction and velocity of the wind, cloud formations and precipitations, but he was able to demonstrate the influence of disturbing strata of the atmosphere. Peaks in the mortality coincided with so-called front days; that is, with days on which a cold wave or a warm wave passed over Berlin. A differentiation proved possible also between the various types of disease, between summer and winter, and between the actions of various changes in the weather.

Foreigners Subject to the Sterilization Law

A decision of the Berlin eugenics court has been approved in a comment by the referee of the minister of justice to whom the matter was submitted. The comment confirms that the court rightfully assumes that foreigners also are subject to the law for the prevention of hereditary defects in posterity. The correctness of his view is evident from the general principle that foreigners, during the period of their stay in Germany, are subject to the German laws. The eugenics court is likewise correct in calling attention to the fact that the foreigner can justly claim the right to leave the territory of the reich and thus escape the execution of the order. The purpose of the federal law is to remove from the German people the menace of hereditary diseases. That purpose is attained if the foreigner with hereditary and transmissible defects shall leave the territory of the reich.

MADRID

(From Our Regular Correspondent)

Sept. 5, 1934.

Health Conditions in Spain

Dr. Palanca, formerly director of public health and hygiene, recently published some important data on health conditions in Spain. In dealing with the problem of sewage in Madrid, he said that the sewers empty into the Manzanares River without any previous treatment. The sewage waters in Madrid increased from 12,500,000 liters daily in 1877 to 250,000 cubic meters at the present time, which is more than 4 cubic meters a second. The Manzanares River has a flow of about 700 liters a second, which is a small quantity of water for the dilution of the sewage from Madrid. Water from the Manzanares River is used to water vegetable gardens in Madrid, and these gardens seem to be responsible for epidemics of typhoid. Some time ago Drs. Palanca, La Rosa and Vallejo studied the bacteriologic changes of the waters of the Manzanares River in its course. They found that as soon as the sewage waters from Madrid empty into it their bacteriologic conditions improve a great deal, and it is only 60 kilometers from Madrid, at Aranjuez, that the waters of the Manzanares, having now emptied into the Jarana River (an affluent of the Tagus River) become normal. Dr. Palanca stated that, although it is claimed that sewage waters improve the conditions of horticulture, their use is unhygienic. He reviewed the causes of the higher incidence of infections in the cities than in rural communities. The statistics of 1932 and 1933 gave an average mortality of 16.44 per thousand inhabitants for the nation in a whole. All the Spanish cities except Madrid, Barcelona, Palma de Mallorca, Valencia, Santa Cruz de Tenerife, San Sebastián and four others gave an average mortality higher than that. Palencia gave the highest average mortality (29.93 per thousand inhabitants). No provincial capital gave a lower mortality rate than that of its province in a whole. The mortality due to infections was 4.69 per thousand in provincial capitals and 3.94 for the nation as a whole. The birth rate diminished from 28.34 per thousand in 1932 to 27.81 in 1933. Almeria and Barcelona were the provinces with the highest birth rate (38.18 and 16.39 per thousand, respectively). The mortality from heart diseases and typhoid was higher in 1933 than in 1932, while that from measles and diphtheria diminished. The mortality from homicide increased from 1.02 per thousand in 1932 to 1.36 in 1933; that is, more than 50 per cent.

The Value of Cholecystography

In a lecture before the Academia Medicoquirurgica Española on the value of cholecystography and of duodenal catheterization in the study of evacuation of the gallbladder, Dr. Larrú, a radiologist, described his investigations on the cholecystokinic power of butter when it is added to several food substances. Boyden's meal consists of four egg yolks added to 280 Gm. of cream. The ingestion of egg yolks alone is efficacious in evacuation of the gallbladder. The speaker made investigations on the cholecystokinic action of several drugs: thyroxine, acetylcholine, parathyroid extract, solution of pituitary (by the intravenous or the subcutaneous route) estrogenic substance and magnesium sulphate (through a duodenal sound). The results of the administration of these drugs are inconstant, and their cholecystokinic action is far behind that of egg yolk. The duodenal injection, through a catheter, of either a 25 or 30 per cent solution of magnesium sulphate, or of a 5 or 10 per cent solution of Witte's peptone in water, according to Stepp's method, or of a mixture of the two substances, failed to evacuate the gallbladder; yet the roentgen shadow of the gallbladder rapidly disappeared following the injection of egg yolks through the duodenal sound. A diagnosis of the functional condition of the gallbladder cannot be based on the results of duodenal catheterization, since the duodenal catheter reaches a duodenal crossway where there are secretions from the gallbladder, the bile ducts, the duodenum, the pancreas and the stomach, which make a diagnostic interpretation difficult. Except when indicated, it is advisable to avoid repeated duodenal catheterization of certain patients, because it has a harmful effect on the hepatic cells. As a treatment for retarded evacuation of the gallbladder, which frequently complicates infections, as typhoid, it is advisable to give the patient some egg yolk. This treatment is not indicated if there is calculous cholecystitis.

Dr. Vital Aza spoke on the dangers of the intravenous injection of solution of pituitary used as a cholecystokinic agent. In regard to the cholecystokinic action of egg yolk he said that Napoleon, who suffered from a gastrohepatic disease, frequently resorted to the ingestion of two egg yolks in some milk, which was followed by an abundant bowel evacuation with a great quantity of bile in the feces.

Dr. Oliver said that the data given by the duodenal catheterization on the functions of the gallbladder are more exact than those given by cholecystography. The gallbladder, which from the clinical point of view and from the results of the duodenal catheterization can be considered as atonic, cannot be so considered sometimes by the results of cholecystography. The problem of atony of the gallbladder bears a certain relation to the physiology of the duodenum, and the treatment of atony of the gallbladder is the same as that of duodenitis. In the treatment of duodenitis, Dr. Oliver uses vaccines prepared from cultures of duodenal secretions given through a duodenal sound.

Clinical Value of Continuous Proctoclysis

Dr. Vital Aza, before the members of the Academia Medicoquirurgica of Madrid, discussed the clinical value of continuous

proctoclysis. According to the teachings in Forgue Massaban's Gynecology (1916), continuous proctoclysis permits the rectal absorption of enormous quantities of liquid (from 8 to 12 liters in twenty-four hours). It is said that under its influence the vascular tension rises, the diuresis increases, thirst attenuates and peristalsis is reestablished. Fifty drops of fluid is injected in a minute, which makes 180 cc. an hour and 4,320 cc. a day. Since the injections are given with intervals of rest (one hour of administration and an hour of intestinal rest), this reduces the amount of fluid to be injected to 2 liters a day. There are other factors, such as variations in the technic, the uneven intestinal absorption in different cases, the care of the patient by nurses, the intestinal reflux of more or less quantities of the fluid and the expulsion of the fluid after a temporary storage in the intestine, which bring the quantity absorbed to about 300 or 400 cc. a day. Continuous proctoclysis is of value to promote the reestablishment of the intestinal peristalsis, which is necessary for the treatment of postoperative intestinal paresis, but not for the absorption of large quantities of fluid by the organism.

Dr. Gutierrez Arrese stated that dextrose solution provokes congestion of the intestinal mucosa. The absorptive capacity of the rectum is scanty, especially beyond the ascending and transverse segments of the colon. In order to restore hydration of a patient it is advisable to resort to the hypodermic route of administration. In many cases continuous proctoclysis provokes a local irritation and catarrhal rectitis, frequently of an intense form, owing to the presence of the sound in the rectum.

Canine Leishmaniosis in Madrid and Infantile Kala-Azar

Dr. Rivera Bandres recently did some research on the presence of canine leishmaniosis in Madrid and its relation to endemic infantile kala-azar. As material for his studies he used dogs from the municipal department of unclaimed dogs. From February 1933 up to the present he has performed necropsies on 450 dogs. Special studies were made with the spleen, the liver and the bone marrow. Leishmaniosis was discovered in twenty-nine dogs, or 6.4 per cent. The lesions were cutaneous and mucocutaneous in 24 per cent of the cases. Their anatomicopathologic characteristics were of a chronic type. The areas having a higher incidence of infantile kala-azar in Madrid coincide with those infested with canine leishmaniosis. Dogs with leishmaniosis frequently showed the presence of ocular lesions (purulent conjunctivitis and specific keratitis). The parasites of human and canine leishmaniosis are probably identical, although adapted in the latter case to the conditions of the host. Cutaneous lesions perhaps constitute the port of entry and the primary localization of the parasite. The presence of leishmaniosis in dogs without any manifestations suggests the possible existence of latent human carriers. The investigator stated that dogs can be considered as reservoirs of the virus of leishmaniosis. Dogs with cutaneous and mucocutaneous leishmaniosis may spread the disease through insects, especially fleas and Phlebotomus.

Defenders of the Medical Profession in Madrid

The medical profession in Spain, especially in Madrid, can be devided into two groups: The first consists of a few physicians who have political influence, with many positions and a profitable practice; the second group, the majority, comprises those physicians whose income from the profession hardly provides the necessities of life. The three principal causes of the critical economic conditions of the Spanish medical profession at present are (1) the admission of patients to free consultation, (2) the uneven distribution of positions controlled by the few, and (3) the health insurance societies. Four fifths of the population in Madrid belong to these insurance societies. A group of young physicians recently formed La Liga de Defensa Médica, to defend the rights of the medical profession in Madrid. The members of the league have put in effect, since last December, the regulations given by the Colegio de Médicos de Madrid (an association of physicians), according to which free medical care should be given only in emergency cases and when the poverty of the patients has been proved. The centers of free medical consultation have been notified of the regulations, which will be maintained by force, if necessary. They also hope to find, in the near future, a solution for the problems of monopolization of positions by a few physicians and of those that arise from the insurance societies for medical care.

Internal Secretions of Sex Glands and Gout

Dr. Marañón recently reported to the Academia Nacional de Medicina of Madrid his experimental observations on the relation between internal secretions of the sex glands and gout. Gout is frequent in ovarian insufficiency and in the early menopause. In man it is frequent after sexual excesses. The speaker believes that the female sex hormone is antagonistic to gout while the male sex hormone favors it. By injecting 500 units of estrogenic substance in a group of women and by keeping them on a uniform diet for a week, he was able to observe in twelve of the women the mobilization of blood uric acid and its appearance in the urine. The results were less manifest with injections of corpus luteum extract. The male hormone does not seem to exercise any mobilizing effect on blood uric acid.

The Adulteration of Food in Madrid

The prices for food in Spain are high. In spite of this fact, food, especially milk, is frequently adulterated. The technicians in the municipal department for the control of the quality of milk sold in Madrid find that more than half of the samples examined have been adulterated, by the addition of the milk of other animals (sheep or goats) or of other substances. The sale of sheep's milk is prohibited in Madrid. Nevertheless more than 100,000 liters of it is sold daily in the city. Municipal regulations require that the public be informed when the milk on sale is from goats, but this milk is sold without notification of its nature. The bacterial contents of milk for the general daily supply should not exceed 30,000 bacteria per cubic centimeter in Italy and the United States and 50,000 per cubic centimeter in England. In Spain it contains about 1,000,000 bacteria per cubic centimeter.

Synthetic products have largely been substituted also for the natural juices of fruits. Dyes are used to falsify the natural color of cold meats and the color of egg yolks in pastry. Wines and chocolate are also adulterated. Of 17,397 samples of food examined during the last year at the municipal laboratory of Madrid, 50 per cent of the samples had been adulterated.

Dining Room for Indigent Patients with Diabetes

Dr. Carrasco Cadenas, a specialist in nutritional diseases, opened a free dining room for indigent diabetic patients in Madrid. The injection of insulin is given, also free, to patients who need it. The wife of Mr. Alexander Lerroux, the president of the cabinet of ministers, devotes a great deal of time to this work. Some persons have criticized the institution, saying that the money thus spent ought to be spent in the fight against tuberculosis.

Dr. Huertas

Dr. Francisco Huertas, aged 86, professor of clinical medicine at the General Hospital of Madrid for sixty years, is dead. He represented the Spanish medical profession at several international congresses of medicine. He was a member of the Academia Nacional de Medicina of Madrid and author of several books on internal medicine.

Marriages

PAUL E. WYLIE, Hohenwald, Tenn., to Miss Virginia Fischer of Hazen, Ark., in Scotts Hill, Tenn., September 15.

JAMES F. REILLY, Vincennes, Ind., to Miss Amy Louise Spencer of Logansport, in Terre Haute, October 13.

VIRGIL MORRISON, Atchison, Kan., to Mrs. Louise Sheeks of Kansas City, Mo., at Liberty, Mo., September 4.

AUGUST H. WITTENBORG to Miss Margaret Kroesche, both of Memphis, Tenn., in New York, September 15.

STUART H. PERRIN, Superior, Wis., to Miss Esther Catherine Cleary of Prior Lake, Minn., September 29.

WILLIAM BRUCE SCHAEFER, Toccoa, Ga., to Miss Orville Tyler of Barnesville at Griffin, October 6.

GEORGE BUTTERFIELD SALTER, Norfolk, Neb., to Miss Audrey Bauer of Erie, Pa., in August.

MORRIS HARRIS, Morristown, N. J., to Miss Rachel Spitz of Poughkeepsie, N. Y., September 4.

JOHN J. D'URSO, Lawrence, Mass., to Miss Vera M. Shannon of Philadelphia, July 14.

THEODORE W. FALKE, Dayton, Ohio, to Miss Betty Celeste McKirchy of Chicago, October 20.

VERONICA C. BARRETT, Brooklyn, to Mr. William F. Fagan of Pascoag, R. I., September 22.

CRAWFORD FANNIN BARNETT JR. to Miss Penelope Brown, both of Atlanta, Ga., October 9.

CHARLES SHERBURNE SENTELL to Miss Sallie Hutton, both of Minden, La., October 2.

CARL J. WOLF, Fremont, Ohio, to Miss Marian Ickes at Cincinnati, September 24.

KENNETH K. KRANING to Miss Virginia Speicher, both of Indianapolis, August 29.

EARL CONOVER to Miss Mildred Lawrence, both of Evansville, Ind., September 3.

LAWRENCE E. ARNOLD to Miss Ann Holt, both of Dallas, Texas, September 8.

JAMES H. ALLEN to Miss Ruth Sanford, both of Iowa City, Iowa, August 18.

ARTHUR LEWIS MILLER, Kimball, to Miss Florence Uhl, recently.

Deaths

William Francis Drewry ⊕ Richmond, Va.; Medical College of Virginia, Richmond, 1884; member of the House of Delegates of the American Medical Association in 1907; past president of the Virginia Conference on Charities and Corrections, American Psychiatric Association, Medical Society of Virginia, and the National Association for the Study of Epilepsy; member, 1924-1929, and since 1929 director of the bureau of mental hygiene, Virginia State Department of Public Welfare; member of the state board of health, 1916-1924; contract surgeon in the U. S. Army and psychiatrist to the National Guard in 1917; since 1920 member of the State Prison Board of Psychiatry; city manager of Petersburg, 1924-1928; member of the board of visitors of the University of Virginia, 1908-1916; for twenty-eight years member of the board of directors of the Petersburg Hospital; superintendent of the Central State Hospital, Petersburg, 1896-1924; aged 74; died, October 19, of carcinoma of the prostate.

Ray William Matson ⊕ Portland, Ore.; University of Oregon Medical School, Portland, 1902; assistant clinical professor of medicine at his alma mater; member of the American Association for Thoracic Surgery and the American Climatological and Clinical Association; member of the executive committee of the National Tuberculosis Association; medical director of the Portland Open Air Sanatorium, Milwaukie; on the staffs of the Veterans' Administration Facility, Good Samaritan and Multnomah County hospitals; aged 54; died, September 12, as the result of an automobile accident.

George Barclay McCallum, Monroe, Mich.; University of Michigan Medical School, Ann Arbor, 1880; College of Physicians and Surgeons in the City of New York, Medical Department of Columbia College, New York, 1881; member of the Michigan State Medical Society; past president and secretary of the Monroe County Medical Society; aged 79; formerly on the staff of the Mercy Hospital, where he died, October 1, of coronary thrombosis.

Shirley Quincy Elmore ⊕ Major, M. C., U. S. Army, Fort Logan, Colo.; Creighton University School of Medicine, Omaha, 1907; served during the World War; entered the Medical Corps of the U. S. Army as a captain in 1920 and in 1929 was promoted to major; aged 53; died, August 7, of coronary thrombosis, while aboard a boat bound for Honolulu.

Elijah McCulloch Harris, Russellville, Ala.; Vanderbilt University School of Medicine, Nashville, Tenn., 1887; member and life counsellor of the seventh district of the Medical Association of the State of Alabama; past president of the Franklin County Medical Society; aged 72; died, September 26, of angina pectoris.

William Emilus Hart ⊕ Elyria, Ohio; Western Reserve University Medical Department, Cleveland, 1886; past president and secretary of the Lorain County Medical Society; served during the World War; on the staff of the Elyria Memorial Hospital; aged 72; died, September 23, of heart disease.

George E. Welch, Palatka, Fla.; Kentucky School of Medicine, Louisville, 1884; formerly member of the fifth district of the state board of medical examiners, mayor and bank president; aged 75; died, September 15, in a hospital at Jacksonville, as the result of cerebral hemorrhage and fracture of the hip.

Edward True Alford ⊕ Waterloo, Iowa; Rush Medical College, Chicago, 1901; fellow of the American College of Surgeons; attending surgeon to the Presbyterian, Allen Memorial and St. Francis hospitals; aged 59; died, September 22, in West Palm Beach, Fla., of heart disease.

John Elwell McQuain, Spencer, W. Va.; Louisville (Ky.) Medical College, 1888; member of the West Virginia State Medical Association; served during the World War; aged 65; superintendent of the Spencer State Hospital, where he died, September 19, of cirrhosis of the liver.

Annie Lee Hamilton, Sandwich, Mass.; Woman's Medical College of the New York Infirmary for Women and Children, 1898; member of the Massachusetts Medical Society; aged 70; died, September 23, in Jamaica Plain, of chronic myocarditis and cerebral hemorrhage.

Henry Thomas Obuchowski ⊕ Newark, N. J.; Tufts College Medical School, Boston, 1925; on the staffs of the Newark City Hospital, St. James' and Presbyterian hospitals; aged 34; died, August 8, in St. Francis Hospital, Hartford, Conn., of subacute bacterial endocarditis.

Robert Alexander McReynolds, McRoberts, Ky.; Memphis (Tenn.) Hospital Medical College, 1906; member of the Mississippi State Medical Association and the Kentucky State Medical Association; aged 49; died, September 8, of coronary thrombosis and hypertension.

Emanuel Frederick Oehler ⊕ St. Louis; St. Louis University School of Medicine, 1906; aged 56; on the staffs of the Missouri Baptist Hospital and the Deaconess Hospital, where he died, September 7, of a streptococcic infection, contracted while operating on a patient.

Gerald Marvin Buchanan, Scotch Plains, N. J.; Vanderbilt University School of Medicine, Nashville, Tenn., 1909; on the staff of the Bonnie Burn Sanatorium; aged 52; died, September 18, in the Protestant Hospital at Nashville, of acute appendicitis and peritonitis.

Gustave Herman E. Starke, Tupper Lake, N. Y.; University of the City of New York Medical Department, 1889; member of the Medical Society of the State of New York; aged 75; died, August 23, in Phoenicia, of cerebral hemorrhage and arteriosclerosis.

William C. Mitchell, Bradford, Ill.; St. Louis College of Physicians and Surgeons, 1904; served during the World War; aged 59; died, September 21, in the Veterans' Administration Facility, Hines, of lethargic encephalitis, parkinsonian syndrome and bronchopneumonia.

Daniel Robbins Nettles, Peterman, Ala.; Medical College of Alabama, Mobile, 1901; member of the Medical Association of the State of Alabama; president of the Monroe County Medical Society; aged 57; died, September 13, in Clearwater, Fla., of heart disease.

Walter Owen Allen, Detroit; Indiana University School of Medicine, Indianapolis, 1921; member of the Michigan State Medical Society; aged 43; died, September 19, in the Parkside Hospital, of cellulitis of the abdominal wall following an appendectomy.

Harry Alfred Halgren, Watertown, Minn.; University of Minnesota Medical School, Minneapolis, 1897; member of the Minnesota State Medical Association; owner of the Cottage Hospital; aged 64; died, September 15, of arteriosclerosis and heart disease.

Erskine Patrick Odeneal ⊕ Gulfport, Miss.; Tulane University of Louisiana Medical Department, New Orleans, 1892; served during the World War; aged 62; died, August 3, in the Touro Infirmary at New Orleans, of carcinoma of the head of the pancreas.

Robert Gill Reed, Cincinnati; Pulte Medical College, Cincinnati, 1889; at one time professor of otology at his alma mater; formerly on the staff of the Bethesda Hospital; aged 73; died, September 17, of multiple sclerosis and cerebral hemorrhage.

Jefferson D. McCullough, Columbus, Miss.; Medical College of Alabama, Mobile, 1888; formerly member of the state legislature; at one time city health officer; aged 73; died, September 8, in the Fite Hospital, of an abscess and diabetes mellitus.

Michele Nigro, Medford, Mass.; Harvard University Medical School, Boston, 1915; member of the Massachusetts Medical Society and the New England Pediatric Society; aged 51; died, August 3, of acute myocarditis and coronary thrombosis.

Henry Shelby McKenzie, Kansas City, Kan.; Kansas City (Mo.) Hahnemann Medical College, 1909; Eclectic Medical University, Kansas City, 1911; member of the Kansas Medical Society; aged 49; died, in September, of myocarditis.

Daniel Chauncey Dye, Utica, N. Y.; University of Michigan Medical School, Ann Arbor, 1885; veteran of the Spanish-American War; on the staff of St. Elizabeth Hospital; aged 74; died, August 31, of chronic myocarditis.

James Kingsland Morange Perrine, San Francisco; Hahnemann Medical College and Hospital of Philadelphia, 1893; served during the World War; aged 62; died, August 30, of coronary occlusion and arteriosclerosis.

James Henry Haslett, Phelps, N. Y.; University of the City of New York Medical Department, 1886; member of the Medical Society of the State of New York; aged 71; was found dead, September 2, at Sodus Point.

Harvey Ellsworth Hall, La Junta, Colo.; Rush Medical College, Chicago, 1890; served during the World War; health officer of La Junta district in Otero County; aged 70; died, September 18, of cerebral hemorrhage.

Henry Watkins Anderson, Covington, Va.; Baltimore Medical College, 1883; member of the Medical Society of Virginia; formerly councilman and county coroner; aged 78; died, September 4, of thrombosis.

William H. W. Sale, Covington, Tenn.; Tulane University of Louisiana Medical Department, New Orleans, 1896; member of the Tennessee State Medical Association; aged 62; died, August 30, of peritonitis.

Francis Xavier Zinger, Detroit; Detroit College of Medicine, 1907; member of the Michigan State Medical Society; aged 51; died, September 2, in the Providence Hospital, of carcinoma of the pylorus.

Edward Houston Hice, Rock Spring, Ga.; Chattanooga (Tenn.) Medical College, 1894; member of the Medical Association of Georgia; aged 65; died, August 24, in a hospital at Chattanooga, Tenn.

Smith McMullin ⊕ Yuba City, Calif.; Kansas Medical College, Medical Department of Washburn College, Topeka, 1900; aged 69; died, August 9, in the Southern Pacific Hospital, San Francisco.

Stephen Farrar Dunn, Wilmington, Vt.; University of Vermont College of Medicine, Burlington, 1904; member of the Vermont State Medical Society; aged 57; died, September 3, of pneumonia.

Charles Coyne Elliott, Leicester, England; Western University Faculty of Medicine, London, Ont., Canada, 1900; formerly a medical missionary in China; aged 56; died, August 10, of carcinoma.

Ralph Coffyn Walker, Portland, Ore.; University of Oregon Medical School, Portland, 1904; member of the American Roentgen Ray Society; aged 56; died, October 1, of cerebral hemorrhage.

Davis L. Field, Jeffersonville, Ind.; University of Louisville (Ky.) School of Medicine, 1868; formerly health officer of Jeffersonville; aged 90; died, September 19, of acute myocarditis.

Calvin McCarroll, Nicosia, Cyprus Island; Detroit College of Medicine, 1904; for many years a medical missionary; aged 59; died, September 9, in the Harper Hospital, Detroit, of pneumonia.

John Alexander Macleod, Kingston, Ont., Canada; University of Toronto Faculty of Medicine, 1907; on the staff of the Ontario Hospital; died suddenly, August 20, of heart disease.

James Malcolm Stewart, Katy, Texas; Louisville (Ky.) Medical College, 1897; aged 56; died, September 7, in the John Sealy Hospital, Galveston, of arteriosclerosis and heart disease.

James Forney Dungan, Exeter, Calif.; Vanderbilt University School of Medicine, Nashville, Tenn., 1891; aged 68; died, August 30, in San Francisco, of arteriosclerosis and heart disease.

John Thompson Maloy ⊕ Bedford, Iowa; Marion-Sims College of Medicine, St. Louis, 1892; president of the Taylor County Medical Society; aged 63; died, September 14, of heart disease.

William H. McKie, Wynne, Ark.; Memphis (Tenn.) Hospital Medical College, 1904; member of the Arkansas Medical Society; aged 54; died, August 31, of cirrhosis of the liver.

Hugh Walden Allan, Taos, N. M.; University of Louisville (Ky.) School of Medicine, 1910; served during the World War; aged 48; died, September 15, of pulmonary tuberculosis.

Thomas James Morgan, Covington, Ky.; Medical College of Ohio, Cincinnati, 1901; past president of the school board; aged 69; died, August 24, of chronic nephritis and myocarditis.

Frederick Henry Odendahl, St. Paul; Missouri Medical College, St. Louis, 1891; Rush Medical College, Chicago, 1892; aged 67; died, September 2, of carcinoma of the pancreas.

J. Du Bois Van Derlyn ⊕ New Paltz, N. Y.; University of Maryland School of Medicine, Baltimore, 1894; aged 69; died, September 2, of chronic myocarditis and aortitis.

William D. Hankins, Birmingham, Ala.; Memphis (Tenn.) Hospital Medical College, 1896; aged 62; died, September 3, in Atlanta, of coronary occlusion and chronic nephritis.

Emil Victor Lonigo, San Francisco; University of California Medical Department, San Francisco, 1883; aged 87; died, August 17, of bronchopneumonia and myocarditis.

William Baumgarten, San Francisco; University of California Medical Department, San Francisco, 1902; aged 56; died, August 11, of chronic aortitis and arteriosclerosis.

Levi Lewis Dorr, San Francisco; Bellevue Hospital Medical College, New York, 1866; Civil War veteran; aged 94; died, September 10, of chronic myocarditis.

George W. Roberts, Wynne Wood, Okla.; Medical College of Indiana, Indianapolis, 1883; aged 79; died, August 7, in Oklahoma City, of myocarditis.

Charles Loyal Sexton ⊕ Los Angeles; Cooper Medical College, San Francisco, 1895; aged 66; died, August 23, of arteriosclerosis and heart disease.

Joseph William Davis, Denver; University of Kansas School of Medicine, Kansas City, 1906; aged 57; died, September 8, of heart disease.

Simon Oltsik, New York; University of Vladimara, Russia, 1922; aged 43; was killed, August 14, when he fell as the result of an epileptic fit.

William Seymour Davis, Los Angeles; Miami Medical College, Cincinnati, 1885; aged 73; died, August 31, of carcinoma of the bladder.

Homer Clark Miller, Altoona, Pa.; Starling Medical College, Columbus, Ohio, 1898; aged 60; died, September 2, of cerebral hemorrhage.

Roy Ricketts Shafer, Rich Hill, Mo.; Barnes Medical College, St. Louis, 1902; aged 57; died, September 5, of carcinoma of the throat.

Joseph W. Enos, Chicago; Hahnemann Medical College and Hospital, Chicago, 1881; aged 76; died, October 11, of chronic myocarditis.

Van Buren McConnaughey, Hillsboro, Ohio; Ohio Medical University, Columbus, 1893; aged 72; died, August 28, of cerebral hemorrhage.

Jokichi Oguri ⊕ New York; Fordham University School of Medicine, 1914; aged 60; died, August 10, of myocarditis and arteriosclerosis.

Louis Doray, Pointe du Lac, Que., Canada; School of Medicine and Surgery of Montreal, 1897; aged 60; died in July, at Montreal.

William C. Mobley, Blue Mountain, Ark.; Missouri Medical College, St. Louis, 1887; aged 76; died, July 6, of myocarditis.

Thomas McCurdy, Coaticook, Que., Canada; McGill University Faculty of Medicine, Montreal, 1889; aged 66; died, August 5.

Correspondence

"COARCTATION OF THE AORTA"

To the Editor:—In the case report by Dr. Wilmot F. Pierce on coarctation of the aorta in THE JOURNAL, September 15, there is the statement on page 831 at the top, "The heart rhythm was absolutely irregular." It was my impression that such a statement has become obsolete except when modified by something more definite, as suggesting sinus arrhythmia, auricular fibrillation or extrasystoles. More than 80 per cent of irregular heart rhythms may be diagnosed definitely without the use of the electrocardiogram. The second sentence following the one quoted gives the electrocardiogram reading, which states that "there was left axis deviation, simple tachycardia, and left ventricle and right ventricle extrasystoles." This seems to indicate that one must have an electrocardiogram to know whether an irregular cardiac rhythm is or is not due to ventricular extrasystoles. Too often this appears to be the case, that is, let the electrocardiogram make the diagnosis of the irregularity. The electrocardiogram has its valued place. Why one cannot base a definite opinion of cardiac irregularities on his own hearing backed up by experience, and then take an electrocardiogram to confirm it, if possible—that would be preferable. THE JOURNAL should set the style by not accepting any statements of the "heart rhythm being irregular or absolutely irregular." A proper physiologic cardiac diagnosis should take its place even if the electrocardiogram does not confirm the original opinion.

NATHAN FLAXMAN, M.D., Chicago.

[This letter was referred to Dr. Pierce, who replies:]

To the Editor:—The correspondent is justified in criticizing the expression "absolutely irregular" as applied to the heart rhythm. It would have been better to say "quite irregular from numerous extrasystoles." "Perpetual arrhythmia," "complete irregularity," if used at all nowadays are usually meant to imply auricular fibrillation. I have no quarrel with him over his contention that an "irregularity" can generally be diagnosed without the electrocardiogram. This should be attempted always. The electrocardiogram should be confirmatory or corrective. This was the procedure in the case reported and I regret that there was not greater care in the use of terms.

WILMOT F. PIERCE, M.D., Chicago.

"BREAST AND ARTIFICIAL FEEDING"

To the Editor:—I should like to offer a criticism of the work reported by Drs. Grulee, Sanford and Herron in THE JOURNAL, September 8, page 735. The authors have done a fine piece of work but I feel that they make a generalization which does not follow the results of their work when they deduce that in order "to decrease further the infant mortality of this country it must be done by encouraging breast feeding."

The authors use as material the records taken from 20,061 babies who were under the care of the Infant Welfare Society of Chicago for as long as nine months during the years 1924-1929 inclusive. The society has stations in the poorest sections of the city.

These infants, in my opinion, do not represent (as the authors claim) "a true cross section of the national urban life," for there are no corresponding data about the infants of the better hygienic or wealthier sections of the city. Nor do better mortality rates of the babies studied (as compared with "nonstation" infants in the same district) make these infants a true cross section of the national urban life. The advantage of good medical and nursing care would lower the infant mortality of any group of infants in any district.

In 1930 I published a study (*New England J. Med.* **203**:626 [Sept. 25] 1930) of breast and bottle fed infants who attended well baby clinics in two different districts in the city of Boston, one "poor district" (North End) and one "better district" (Roslindale). This study included the vital statistics of 1,566 infants and a detailed study (nutrition, development, frequency of infection and presence of deficiency diseases) of 217 infants. Both groups were followed for a period of one year.

In the "poor district" the results were consistent with those reported by Drs. Grulee, Sanford and Herron. The bottle fed infants had a mortality rate seven times that of the breast fed infants. The incidence of infection favored the breast fed by a ratio of 8 to 5. The clinic infants had a mortality rate of about one-half the mortality rates among the nonclinic infants in the same district.

In the "better district" the results were strikingly different. The bottle fed infants compared favorably (to say the least) with the breast fed infants in nutrition, development, presence of deficiency disease, and mortality rates. Also the bottle fed infants had less incidence of infection than the breast fed infants.

I found that the mothers in the "poorer district" were "sold" on the idea that breast feeding was best for the infant and bottle feeding was not considered until the breast fed infant did poorly. As a result the bottle fed infant in this district started with a distinct disadvantage. Again lack of cooperation (often the father would not permit the use of any sugar in the milk; water and sugar formulas were used) and faulty technic and procedure in preparing and feeding the formula, plus improper hygiene (overcrowding and so on) gave the bottle fed infant a definite disadvantage.

In the "better district," although the medical care and nursing care were the same as in the "poorer district," the better economic and hygienic conditions with a higher degree of intelligence and uniform cooperation resulted in the group of bottle fed infants comparing favorably with the breast fed infants.

I feel that it is no longer a question of breast or bottle feeding but one of proper nursing and medical care plus intelligent cooperation from the parents, plus proper hygienic and economic conditions. Drs. Grulee, Sanford and Herron prove what I have suggested before, that in a "poorer district" the bottle fed infant is at a distinct disadvantage as compared with the breast fed infant.

Finally, I suggest that the infant mortality of this country will be decreased by improving the hygienic and economic conditions of the poorer sections of the cities and by a program of persistent "infant education" with special emphasis on correcting the "breast feeding at any price" attitude among these people, so that there will be less delay in bottle feeding (in whole or in part) when there is a deficient or defective breast milk.

MANUEL M. GLAZIER, M.D., Boston.

[This letter was referred to Dr. Grulee, who replies:]

To the Editor:—Apparently from Dr. Glazier's remarks, we are talking about two different things. The group of artificially fed infants, as explained in the text, were fed artificially from the very first and these we followed for a period of nine months. These children were practically all first seen in the first month of life. The cases which he refers to would be included in our second group, or those partially breast fed. In that group there were two classes of cases: first, those that were simply complemented because of insufficient supply of breast milk and, second, those who were breast fed at first and artificially fed later. It is true that these children were in the poorer districts and that they were subject to more infection than we would expect to find among the better classes of the community.

On the other hand, the death rate was extremely low, about one fourth of the general death rate of the community at large.

I am under the impression that the general death rate in Boston is higher than it is in Chicago. After all is said and done, the fact still remains that for those children who are entirely breast fed the death rate was so low as to be near the vanishing point and certainly I cannot see how Dr. Glazier can claim that his statistics in any group of artificially fed children, under any conditions, are better than those for the group of breast fed children in our paper.

Dr. Glazier objects to the statement that "this is a true cross section of national urban life." It is a true cross section only perhaps so far as nationality is concerned and was meant to convey that impression. Then, as far as mortality is concerned, the results are far better than those obtained throughout the city for the same age group. The report of Dr. Glazier is inconclusive because of the small number of cases which he has reported. Certainly he cannot claim much for his statistics other than those for the 217 of the detailed study.

In conclusion, Dr. Glazier states "that infant mortality of this country will be decreased by improving the hygienic and economic conditions of the poorer sections of the cities and by a program of persistent 'infant education' with special emphasis on correcting the "breast feeding at any price" attitude among these people." If Dr. Glazier feels that way after reviewing our statistics, I am sure I do not know how we can persuade him that he is wrong. To me these statistics are very conclusive evidence that breast feeding does protect the child under adverse conditions. In my opinion it is utopian to think that such adverse "hygienic and economic" conditions as the poor of large cities now experience will be overcome at any time in the near future. CLIFFORD G. GRULEE, M.D., Chicago.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

TREATMENT OF SYPHILIS WITH TUBERCULOSIS

To the Editor:—I have a woman patient 30 years of age whose sputum is positive for tuberculosis and whose temperature ranges between 99.5 and 100.5 by mouth. Six weeks ago iritis developed and a blood Wassermann reaction was four plus. An attempt was made to treat her with a soluble bismuth compound intramuscularly and the temperature was increased and the patient complained of pain in the gums. A few days later an injection of mercuric salicylate intramuscularly was given and this time the temperature was not increased but the patient had severe pains about the gums and marked salivation. Four days later I decided to try an intravenous injection of 0.3 Gm. of neoarsphenamine. This resulted in a chill, and the temperature rose to 102. As a result of all three treatments the eye condition has cleared up to a marked degree, but I am wondering what to do for her as far as her syphilitic condition is concerned. She obviously is not reacting well to bismuth or mercury compounds or neoarsphenamine, possibly on account of her pulmonary condition. Also on account of her tuberculosis, I am afraid to give her potassium iodide. In spite of both diseases the patient feels fine, is free from any pain or discomfort, has a good appetite and is not losing in weight. She has had the pulmonary condition for about two and a half years, but for the past year and a half examination of the sputum has been negative until the iritis developed. What treatment would you advise at the present time? Please omit name. M.D., New York.

ANSWER.—The treatment of syphilis coincident with tuberculosis depends, in general, on the status of the two disease processes. The inquiry does not supply sufficient information as to the age of the syphilitic infection, though it may be presumed that the occurrence of the iritis, if indeed it is syphilitic, would place the spirochetal infection within the first two or three years of its course. It should be noted also that the inquirer does not mention the confirmation of the positive serologic test by repetition and by the use of at least two laboratory technics. This is important, because false positives are known to occur in tuberculosis in the absence of syphilis, to say nothing of the possibility that a single four plus Wassermann reaction may be the result of a laboratory error. If the iritis is nonsyphilitic instead of syphilitic and the syphilitic infection is of prenatal type or a well established latency, there is less demand for intensive antisyphilitic treatment from the standpoint of the syphilis, and the open tuberculosis as such should receive the major portion of attention. The merits of these various situations have been considered in the literature by Petersen and Hecht, Habliston, Schlesinger, Landis, Gloyne and particularly in a valuable study by Gallant. The work of these observers is summarized in Moore's and Stokes's (second edition) textbooks. Gallant's study of 346 cases showed clearly the unfavorable effect of the untreated syphilis on tuberculosis, the mortality in cases untreated for syphilis being 57 per cent and that in those who received treatment for syphilis 21.5 per cent. Coincidentally, improvement under treatment for syphilis rose from 20.9 per cent to 51 per cent. Using the National Tuberculosis Association's classification, Gallant found that the best results with treatment of the syphilis occurred in the minimal group, and the poorest results in the advanced cases. Moore believes that the relatively less intensive treatment used by physicians in charge of tuberculosis sanatoriums and the advantages of sanatorium care largely explain the superior results of this type of management as compared with ambulatory and outpatient treatment. He recommends that open tuberculosis be placed under sanatorium conditions as rapidly as possible when treatment for syphilis is indicated. Gallant and Stokes both point out that very active tuberculous disease with high temperature is made definitely worse after antisyphilitic treatment, and the terminal stages of tuberculosis with cachexia are contraindications. On the other hand, Gallant found that even the increased tendency to reaction was not often harmful even in advanced cases, and that antisyphilitic treatment apparently reduced the death rate among them none the less. Gallant found the arsenicals in general to be responsible for increasingly favorable results. Stokes prefers neoarsphenamine to arsphenamine, and Gallant reduces the arsenical dosage to one-half or one-third the usual amount. The difficulty with the administration of bismuth compounds in the case described may be due to neglect of mouth prophylaxis or to initial overdosage, for bismuth should, in general, be well tolerated by the tuberculous patient and is easily adaptable to the special difficulties of treatment. The effect of treatment on the eye in this case does not necessarily prove the etiology of the iritis to be syphilitic, although of course it suggests it.

It is advised that after a more careful attempt to determine the status of the syphilitic infection this patient be, if possible, given the benefit of sanatorium care, that lower neoarsphenamine dosage be employed and that bismuth compounds likewise in materially reduced dosage be used instead of mercury for the heavy metal phase of the treatment.

VARICOSE ECZEMA WITH RINGWORM INFECTION

To the Editor:—A woman, aged 76, whose family and medical history are otherwise negative, has been suffering from varicose veins of the legs for many years. Occasionally a varicose ulcer has developed on one of her legs, which always healed without much difficulty. About nine months ago this ulcer again reappeared in a mild form. This time there was a dermatitis of the skin surrounding the ulcer area. This gradually extended up toward the knee. It would improve considerably and then would suddenly reappear over night and was occasionally associated with small blebs. About four months ago she began to notice a slight dermatitis associated with marked itching. This was all over her body, particularly the arms, neck and legs. This varied in intensity from day to day and when it had nearly disappeared would again reappear over night in increased severity. At present she has this dermatitis over the entire body, with considerable induration of the skin of the forearms. She has no other symptoms than itching due to the dermatitis. Physical examination revealed nothing except the skin eruption. The urine is normal. The blood pressure is 116 systolic, 84 diastolic. The blood sugar is 87 per cent; leukocytes, 12,000; polymorphonuclears, 38 per cent; small lymphocytes, 35 per cent; large lymphocytes, 3 per cent; eosinophils, 24 per cent. Kindly express an opinion as to the diagnosis and advise treatment. Please omit name. M.D., Pennsylvania.

ANSWER.—Varicose eczema, with the possibility of a superimposed ringworm infection, is not rare. The generalized, itching dermatitis, however, together with the finding of 24 per cent eosinophils may suggest a sensitization reaction on an allergic basis. It must be remembered, however, that a great many skin diseases show eosinophilia. Large doses of calcium gluconate and slow intravenous injection of 10 per cent sodium thiosulphate may alleviate the symptoms, provided further sensitizations do not occur. One should be sure that the original lesion around the ulcer is not maintained by a ringworm infection, in which case suitable treatment should be instituted. The possibility of a chemical dermatitis from salves applied to the ulcer, which may provoke a generalized reaction, should also be considered. The patient may benefit by consulting a competent dermatologist who is interested in the cutaneous phenomena of allergy.

PHYSIOLOGY OF LACTATION

To the Editor:—Will you kindly explain the cause and give the treatment of the following phenomenon: A girl, aged 18, can express an ounce or more of milk from each breast at will. This condition has existed for five months to the patient's knowledge and may have existed longer. There is no appreciable evidence of glandular disturbance; she is not pregnant and is apparently normal in all other respects. Please omit name and city.

M.D., District of Columbia.

ANSWER.—The cause of the apparently spontaneous lactation by both male and virgin mammals, otherwise normal, has not been determined. Lactation has been induced experimentally in both male and virgin laboratory mammals in a number of different ways, the chief one being the injection of extracts of the anterior lobe of the hypophysis which contain the active principle termed prolactin. Lactation has been observed experimentally in animals after producing lesions of the ovary, which tends to confirm the suspicion of some older clinicians that "ovarian irritation" was responsible for lactation in a virgin. In most cases in either sex spontaneous lactation is the result of a mechanical stimulus applied to the breast, the usual and most potent stimulus being sucking. It rarely occurs associated with acromegaly, pituitary enlargement, uterine myomas and pseudocyesis. It has occurred as a sequel of endemic encephalitis. In the male, spontaneous lactation (colostrum or milky fluid) has occurred associated with chorionepithelioma of the testis and also hypernephroma and pineal tumor. The most recent reference is by Krestin (*Lancet* **1**:928 [April 30] 1932).

There is no satisfactory treatment. From the aspect of hormone therapy, lactation in the rabbit may be inhibited by large doses of estrogenic substance. The luteinizing fraction of pregnancy urine inhibits lactation in nursing mice. Theoretically, progestin (the corpus luteum principle) should also be effective. However, there is so much species variation in the ovarian-pituitary-mammary gland interrelationship and so little is known definitely about this interrelationship in man that any hormone therapy would be entirely experimental. Further, it is possible in view of the age of the patient that hormone therapy might do harm. Roentgen therapy over each breast has been used in cases of spontaneous lactation and galactorrhea, definite diminution of secretion being obtained. How lasting the effects of roentgen therapy would be, or its effect on future functioning of the gland, is not answered in the literature. The simple treatment of a tight binder with boric acid dressing of the nipples to prevent infection should be tried.

CONTACT DERMATITIS FROM WEEDS

To the Editor:—A patient of mine, a farmer, has a yearly rash, which covers his face, his forehead and the front of his neck. It is characterized by intense burning and itching. He states that the rash comes on each year about the first of August when he starts weeding his potatoes and, if he continues to work among the weeds, continues until frost kills the weeds off. When I saw him the region outlined was subacutely inflamed and was "weeping" considerably. Can you give me any idea as to the nature of the weeds that might cause this? What can be done in the way of treatment to give permanent relief? Please omit name.

M.D., Massachusetts.

ANSYER.—The type of case cited is not uncommon. It is undoubtedly an instance of contact dermatitis, most likely due to contact with a plant. This form of dermatitis constitutes a hypersensitiveness that does not fit in the group commonly called allergy. The irritation is usually due to the ether-soluble fraction of the plant or to its pollen rather than to the protein fraction. Contact dermatitis caused by hay fever plants is usually present in the absence of any hay fever symptoms. An individual may be sensitive to almost any plant. The various species of ragweeds have been known to cause dermatitis rather frequently. In the region of the inquirer the short ragweed (Ambrosia elatior) is the only species of ragweed present in any abundance. It should be remembered, however, that almost any plant growing in the season mentioned may be responsible. The potato vine must not be disregarded.

In order to make a definite diagnosis of the causative agent, the following procedure is advised: A specimen of every weed and plant in the field should be obtained. A small piece of the leaf of each plant should be placed on a separate piece of gauze about an inch square. If the leaf is too dry, it may be moistened with liquid petrolatum. This "patch" is applied with the leaf next to the surface of the skin. The gauze is then covered with a square of oiled silk and the patch is fastened to the skin with adhesive tape. A number of such patches may be applied to the back at one time. The patches are removed in from twenty-four to forty-eight hours. If there is marked irritation underneath any of them it may be removed sooner. A positive reaction will be evidenced by a redness, going on to vesiculation and edema and accompanied by a burning and itching sensation.

When the causative factor has been determined, specific treatment is possible. This usually consists of intramuscular injections of an extract of the ether-soluble portion in almond oil. No definite strength of doses can be recommended, since that would depend on the nature of the plant, the potency of the extract and the degree of sensitiveness of the individual. One must be guided by the reaction of the patient and begin with high dilutions, as is customary in other types of desensitization. The success of such treatment is not certain, although it holds forth encouragement. Because of the technical difficulties in preparation of such an extract it would be advisable to have it prepared by an allergist or a laboratory accustomed to prepare such extracts.

ALLERGY TO PIN OAK

To the Editor:—Will you please inform me as to the usual allergic manifestations from pin oak and just how they are caused, other than by contact? Is this form of allergy common and has it any age preferment? What treatment would you suggest? Please omit name.

M.D., Philadelphia.

ANSWER.—Pin oak (Quercus palustris) is only one of the many varieties of oak that are found in North America. In the United States there are about sixty-five different species. The other important varieties of oak are the red, scarlet, black, white and post oak.

Pin oak, in the section east of the Mississippi River and north of Tennessee and North Carolina, pollinates from about the 10th to the 26th of May. Other varieties of oak pollinate for longer periods and the post and black oak throw out their pollen as late as about the middle of June, so that oak pollen is in the air from about May 10 to about June 15.

The various species of oak tree are probably the most important causes of tree hay fever and the symptoms appear at the time of pollination of the various kinds of oak. A patient who is hypersensitive to one variety of oak is usually also susceptible to the other species. About 5 to 10 per cent of all hay fever is due to tree pollen. A considerable proportion, perhaps as high as 40 per cent who are sensitive to tree pollen develop bronchial asthma.

There seem to be no age preferment.

The treatment of hay fever and bronchial asthma due to any variety of oak is similar to that due to the pollen of grasses and ragweeds; that is, complete skin tests are done, including not only the various pollens but also tests, if possible, for the epidermals, foods and miscellaneous proteins; and injections of mixed oak pollen extract should be started about three months before the season, about March 1, and from fifteen to twenty-five injections should be given with gradual increase in strength so that the maximum dose may be given just before May 10.

The extracts with minute directions may be purchased from several different pharmaceutic firms. It is important to follow the instructions so as to avoid possible reactions that may occur after the injections.

DIPHTHERIA

To the Editor:—Is there any way one can tell whether or not a child who has had diphtheria antitoxin did or did not have diphtheria? How soon, in your opinion, after the antitoxin is given will a culture show negative?

J. L. WILLIAMSON, M.D., Burnet, Texas.

ANSWER.—The cultivation of diphtheria bacilli from the local lesion is the only certain way of telling that a child has diphtheria. After recovery the bacilli often persist, in which case their presence strongly suggests that the preceding disease was diphtheria. It may happen that a carrier of diphtheria bacilli who is immune and gives a negative Schick reaction may develop tonsillitis from other forms of infection. Here the cultivation of diphtheria bacilli would not be proof that the disease was diphtheria. It is always hazardous to predict when negative cultures will be secured in an individual case. The giving of diphtheria antitoxin does not directly influence the bacilli or determine the occurrence of negative cultures. Observations in large series of cases have indicated that after diphtheria about 20 per cent become negative during the first week and that about 50 per cent of those which are positive at the beginning of each subsequent week become negative during that week. About 70 per cent become negative three weeks and about 85 per cent four weeks from the onset of the disease. Bacilli can be cultivated from but few after six or seven weeks. A few become persistent carriers for an indefinite time.

TREATMENT OF HYPERTENSION

To the Editor:—A man, aged 54, has a blood pressure between 240 and 290, causing severe headaches and inability to do any type of work although he was always active up to the time of his first attack, five years ago. I have been unable to find a cause for this hypertension. All different types of nitrites have been tried; a salt-free diet has been rigorously enforced, and his weight has been brought down from 210 pounds (95 Kg.) to 145 pounds (66 Kg.) by observance of this diet. Phlebotomy has been the only real relief given, and it is done at monthly intervals at least. During his last stay in the hospital I used magnesium sulphate 25 per cent, 10 cc. intravenously, which gave him relief for a short time but almost caused death while being injected. The only diagnosis that I have been able to make is essential hypertension. Have you any idea what effect the use of ergotamine tartrate would have? Kindly omit name.

M.D., New York.

ANSWER.—It is unfortunate that the diastolic pressure of this patient was not stated. It must be repeatedly and emphatically reiterated that from the points of view of diagnosis, prognosis and therapy, the diastolic tension is essential to a clear understanding of the circulatory difficulty. As regards the cause of this patient's excessive hypertension, information is lacking with regard to pertinent questions of his history. It may be stated as a generalization that probably hereditary and familial factors of physical and emotional constitution are the most common etiologic factors in hypertensive arterial disease. However, the instances in which the disease is due to but one factor are exceptionally rare; almost invariably there are numerous superimposed insults to the circulatory apparatus (Stieglitz, E. J.: Arterial Hypertension, New York, P. B. Hoeber, 1930). Commonly the etiologic factors have ceased to exist and are no longer operative by the time the hypertensive disease is discovered, for the onset of this disease is insidious, gradual and as a rule wholly asymptomatic. The disease tends to progress continuously despite the disappearance of the original initiating factors, for, once started, the pathogenic changes are progressive and largely self perpetuating. Therefore it is in the past that one must look for the probable etiologic factors of the disease. Just when these were operative can usually be approximated by a careful analysis of the patient's history. In this instance the onset was probably from ten to twenty years ago.

From the query it may be assumed that either extensive sclerotic changes have already occurred or that some active but as yet undiscovered etiologic factor is still operative. The failure of all the various nitrites and other vasodilators to reduce the arterial tension justifies this conclusion. A remote possibility is that this rigid hypertension is due to coarctation of the aorta; this could be readily ascertained by observation of the arterial tension in the legs as contrasted with that in the arms. The patient's age, however, makes this possibility extremely remote. If extensive arteriolosclerosis has already occurred, none of the vasodilating drugs can be expected to accomplish much. In fact, as all his symptoms appear to be cerebral, violent vasodilatation may be most precarious; it has been shown that amyl nitrite may increase the intracranial tension with a rise in spinal fluid pressure (Hare, C. C.: *Bull. Neurol. Institute of New York* **3**:513 [March] 1934). Hypertonic dextrose solution injected intravenously may cause a transient rise in spinal fluid pressure, followed by a fall for two or three hours and then a rise to above the original level (Masserman, J. M.: Effects of Intravenous Administration of Hypertonic Solutions of Dextrose, THE JOURNAL, June 23, 1934, p. 2084). The risks of magnesium sulphate, when given intravenously in hypertonic solution, are sufficient to preclude its justification in this type of patient. Acute cardiac reactions are not uncommon (Adair, F. L., and Stieglitz, E. J.: Obstetric Medicine, Philadelphia, Lea & Febiger, 1934, p. 434). Hirschfelder has pointed out the dangers of increased blood magnesium, which may be responsible for coma (Hirschfelder, A. D.: Clinical Manifestations of High and Low Plasma Magnesium, THE JOURNAL, April 7, 1934, p. 1138). Ergotamine tartrate cannot be expected to accomplish anything for this patient and even may be injurious. The reduction of the patient's weight, if not carried too far, is certainly desirable. Not knowing how tall he is, one cannot say how marked his obesity was. Phlebotomy, if not too extensive or repeated too frequently, is quite justified so long as repeated examinations of the blood are made so that any secondary anemia may be prevented. In the long run such therapy is usually unwise, for the presence of an anemia is markedly aggravated with the progressive changes of the disease and the severity of the cerebral, cardiac and renal impairment. In this particular instance blood volume studies might be illuminating, although changes in blood volume are almost never a factor in long continued hypertensive disease.

If the assumptions are correct, and they can be no more than assumptions from the data at hand, the most satisfactory therapy for this patient should be the administration of mild, nontoxic sedatives, such as the bromides, over a relatively long period. These should aid in obtaining some symptomatic relief and if the arteriolosclerosis is as extensive as it appears to be, symptomatic relief and reassurance are all that one may hope to accomplish.

ANTIPHLOGISTIC ACTION OF ANALGESICS

To the Editor:—In recent years a note of caution has been sounded in regard to massive doses of salicylates on the ground that their analgesic effect on rheumatic arthritis was due to their depression of the reactivity of serous surfaces, the implication being that this depression of defensive function might extend to the endocardium and predispose to an endocarditis. Does this depressant action of the salicylates extend to other inflammatory processes? I recently observed a patient with a boil on his face—in fact, a hydraheaded monster that might more accurately be termed a carbuncle. One-half grain (0.03 Gm.) doses of codeine had almost no effect on the pain, but 10 grains (0.65 Gm.) of acetylsalicylic acid would give complete relief for three or four hours. It was interesting to note that not only pain but local tenderness was greatly diminished while the salicylates were in effect. It seemed unlikely that this was purely a central nervous system effect, as codeine was ineffective. On the other hand, if the effect was due to a depression of the inflammatory reaction with consequent diminution of tension it was a microscopic action, as the degree of redness and swelling appeared unchanged. The question naturally arises as to whether such a presumed depression of normal tissue response is justified for the sake of relieving pain. Is one thereby prolonging the process of necrosis and liquefaction and perhaps interfering with normal protective mechanisms? Please omit name.

M.D., Massachusetts.

ANSWER.—It is an interesting fact, an instance of which is shown in the effect of the 0.65 Gm. dose of acetylsalicylic acid on the boil, that analgesics also have an antiphlogistic action. This, however, is true also of opiates such as codeine; but it would have required a larger dose than the 0.03 Gm. dose employed to demonstrate this action. That such an effect is obtainable from codeine is illustrated by the observations recently made regarding the efficiency of this agent in the treatment of coryza (Harold S. Diehl, 1933). The effect is probably similar to that which occurs when a person who has a cold and a running nose, requiring continued use of the handkerchief, goes to sleep: the discharge almost ceases during the sleeping hours. It is doubtful that this diminution of the inflammatory reaction is sufficient in degree to be dangerous, but it is evident that it does not really help in overcoming the infection.

MEMBRANES AND PLACENTA OF QUINTUPLETS

To the Editor:—As no doubt others have done, I wish to call your attention to the report on the Dionne quintuplets by Dr. Dafoe in THE JOURNAL, September 1. The question arises in my mind as to how it was possible for the last two babies to be born with membranes intact and yet for the placenta and cords to remain unseparated in the uterus, as the report would seem to suggest.

L. V. BLUM, M.D., Wilmington, Del.

ANSWER.—It is possible for a fetus to be delivered in an intact amniotic sack, the amnion having stripped completely away from the chorion. Such an occurrence has often been noted in early abortions, in which event the cord usually breaks off with the amnion at the placenta. In the later months such a condition is much rarer and then usually the amnion is stripped off of the cord to the baby's navel, there being an accumulation of the fluid between the amnion and Wharton's jelly.

MYCOTIC DERMATITIS

To the Editor:—I have been treating a case of mycotic dermatitis in the axilla for eight months without a complete cure. The medication that has given the most relief is the salicylic acid, sulphur and zinc oxide ointment. However, this does not clear it up in the cases of the axilla. What would you suggest? Ultraviolet rays and x-rays have been of no value. Please omit name.

M.D., Minnesota.

ANSWER.—The diagnosis of mycotic dermatitis implies that the diagnosis has been confirmed by the demonstration of fungi in scrapings from the axilla. Epidermophyton inguinale is frequently the cause of such a dermatosis, although many other fungi have been reported as causing the disease. The upper part of the thighs and under pendulous breasts are also common sites for the appearance of this condition. The use of salicylic acid and sulphur in strengths varying from 1 to 5 per cent is frequently efficient, although a solution of sodium thiosulphate (10 to 15 per cent strength), sopped on two or three times a day, may be more comfortable than an ointment. Care must be exercised not to apply keratolytics which are too strong to the axillae, groin or under the breasts, because a

secondary dermatitis may develop in these areas from comparatively weak applications. A solution of benzene containing 2 per cent iodine painted on once a day or calamine lotion to which 0.005 per cent phenol has been added is useful in the "finishing off" of treatment. In obese individuals a restriction in the amount of sugar and other carbohydrates ingested is often of value, as Caro has shown that fungi produce dermatitis in the axillae, groin and under the breasts more frequently in those patients in whom the sugar content of the sweat is higher than normal, although no evidence of diabetes mellitus can be demonstrated.

HEADACHES AT MENSTRUAL PERIOD

To the Editor:—I have a patient, aged 34, who has been having headaches one week before each menstrual period for the past seven and one-half years. She has one child, aged 14, but has had no other pregnancies. The headaches are sometimes frontal and sometimes temporal but never in the temporal and frontal regions at the same time. Physical examination reveals no abnormalities and no evidence of disease. Wassermann and Kahn tests are negative. Blood count, urine and metabolism rates are normal. An eye, ear and nose consultant found no pathologic changes. Roentgen examination of the sella was not made. Before treatment was started the patient had frequent headaches, which apparently were not connected with menstruation. These have been overcome by the removal of worry and by suggestive therapy. The first month that an anterior pituitary-like substance (followed by theelin) was given there was no headache at all. The three successive months the headache was markedly improved; the fourth and fifth months of this treatment the headache became severe again, always occurring from five to seven days before the onset of the menstrual period. Following administration of the anterior pituitary-like substance and theelin the scanty menstruation became normal in amount. I have been unable to unearth any cause of revolt against menstruation. Elimination diets had no influence on the headache; there is no other manifestation of allergy. I shall appreciate any suggestion concerning diagnosis and treatment. Please do not publish my name.

M.D., Texas.

ANSWER.—In most of the cases in which endocrine products have relieved the type of headaches described in the query, the results have been about the same as those noted in this case. Other glandular products will hardly prove more successful. The headaches in this case may be related to the migraine headaches, which are extremely difficult to relieve. A drug that has proved to be helpful in many cases of migraine is ergotamine tartrate, though care should be exercised that ergotism is not produced. There is some difference of opinion as to whether ergotamine tartrate will relieve headaches that are not of migraine origin, but the drug has definitely proved to be helpful in cases of headache not classed as migraine. Gynergen is the proprietary name for ergotamine tartrate; it is used mainly in obstetrics and gynecology. The drug is best given intramuscularly, subcutaneously or intravenously, but it may also be taken by mouth. The drug does not cure or prevent the migraine type of headaches but it frequently brings about quick relief from attacks.

REMOVAL OF LIME FROM ALUMINUM KETTLE

To the Editor:—I should like to know if there is anything that will remove the lime from the inside of an aluminum teakettle.

M.D., Indiana.

ANSWER.—An inquiry was made of the Aluminum Company of America. The firm replied:

There are two general methods of removing lime deposits from the inside of an aluminum teakettle. The simplest method is to gently heat the empty kettle over an open flame. Care must be taken, of course, that the aluminum is not overheated and melted. This treatment will frequently be adequate to cause the deposited lime to crack loose from the aluminum, so that it can be emptied out. Tapping the kettle while hot or pouring cold water into it while hot also aids in this mechanical method of removal.

In case the lime cannot be satisfactorily removed by the above method, the kettle should be partially filled with vinegar, which should be held at the boiling point until the lime has been completely dissolved, or at least softened so that it can be easily slushed out.

ANIMAL SUSCEPTIBILITY TO GONORRHEAL INFECTION

To the Editor:—Would it be possible to implant the discharge that is suspected of gonorrhea into the eye, penis or vagina of a rabbit, dog or kitten? All the tests that I have ever read about are not simple enough and I do not remember that I ever read anything about this test.

A. C. MULLER, M.D., Sacramento, Calif.

ANSWER.—The animals mentioned are not susceptible to the gonococcus and consequently implantation of a suspected discharge cannot yield information of diagnostic value.

EFFECTS OF MERCURY IMPREGNATION ON HAIR

To the Editor:—One of my patients used hair tonic containing corrosive mercuric chloride and resorcinol in alcohol. The last application was about six months ago. Now when she has a test curl before a permanent wave it is found that the hair dyes intensely black. Repeated rinsing has not altered this. It seems to me probable that it is due to persistence of some of the mercury, which is oxidized by the heat. Do you know of any way to correct this?

RICHARD F. HERNDON, M.D., Springfield, Ill.

ANSWER.—Gray human hair was tested by soaking it for five days in a 20 per cent solution of resorcinol in 50 per cent alcohol. The hair was then rinsed in water, partly dried and heated with a curling iron heated to sizzling temperature as tested by the time honored saliva method. The hair showed no change in color after heating. A second specimen of hair was soaked for the same length of time in 2 per cent solution of corrosive mercuric chloride in 50 per cent alcohol, rinsed in water, partly dried and subjected to about the same degree of heat. It turned yellow at the point heated. This rough test corroborates the correspondent's theory; but to stand criticism the test would have to be repeated at a scientifically measured temperature.

As nothing is known of the chemical combination of the mercury within the hair, no advice can be given for its removal. If a sulphur combination has taken place, as might be assumed from the fact that the sulphur content of the hair is large, then removal will be difficult. It seems probable that the patient will have to avoid any hairdressing operation that necessitates the use of heat until the hair impregnated with mercury has fallen out or has grown long enough so that the impregnated ends may be cut off. This may take another six months or more.

TREATMENT OF WARTS

To the Editor:—In THE JOURNAL, September 8, page 775, is a query regarding the treatment of warts on the face. I should like to mention the results of treatments of verrucae vulgares by intramuscular injections of bismuth salicylate (Lurie, Sophie A.: Verrucae Vulgares, *Arch. Dermat. & Syph.* **26:** 95 [July] 1932) and discussions on the same subject at the state medical convention, Delmonte, Calif., April 24-27, 1933 (*California & West. Med.* **39:** 386 [Dec.] 1933). My further observations gave an opportunity to see the disappearance of various varieties of warts (vulgaris, filiformis, plana) multiple and various in size on the face, forehead, front of the neck, and on the left arm pit.

A beauty parlor operator, whose face was almost entirely covered by verrucae planae for years, received elsewhere roentgen treatments and "pills," of yellow mercurous iodide, I presume, without any visible results. Two bismuth salicylate intramuscular injections cleared her face absolutely.

A school teacher had on her forehead numerous verrucae planae for five years. She also had received roentgen treatments elsewhere without success. Three intramuscular injections of bismuth salicylate gave a spectacular result.

A motion picture technician had tumor-like formations of verrucae vulgares on the forehead for many years. They responded beautifully after three treatments.

A business man had a filiform-like verruca the size of a large pea on the front of the neck for many years; it responded after one treatment.

A high school girl was disfigured by numerous hanging filiform-like warts on her face; three treatments gave the desired result.

A school boy 12 years of age was afflicted suddenly with fifty cornified, hypertrophic, filiform warts on the left arm pit; two treatments gave a spectacular success.

SOPHIE A. LURIE, M.D.,
Los Angeles.

FUNCTION OF THE EPIGLOTTIS

To the Editor:—In the reply to a question on the function of the epiglottis in Queries and Minor Notes in THE JOURNAL, September 22, no mention was made of the conclusions of Negus:

"The original function of the epiglottis was that of shutting off the mouth from the pulmonary air tract, in order that all air should pass through the nose and keep up the keenness of the olfactory sense. In Man . . . the epiglottis has ceased to have any important olfactory function. . . .

"As regards respiration the organ has almost no function. . . .

"Its influence on deglutition is slight. . . .

"The epiglottis, as a whole, is pressed against the base of the tongue during swallowing and does not fall back as a lid to the laryngeal aperture, as was at one time supposed. The greater part of the organ can be removed without any noticeable effect on the individual." (Negus, V. E.: The Mechanism of the Larynx, St. Louis, C. V. Mosby Company, 1929, p. 449.)

This is a reiteration of conclusions reached by the same author earlier, in his article "The Function of the Epiglottis" in the *Journal of Anatomy* (**62:** 1 [Oct., part 1] 1927). It seems to me that the monograph by Negus (although I dislike its anthropomorphic style) would be invaluable to any one giving speech courses.

OSCAR V. BATSON, Philadelphia.
Professor of Anatomy, University of Pennsylvania
Graduate School of Medicine.

Council on Medical Education and Hospitals

COMING EXAMINATIONS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOGY: *Written (Group B candidates).* The examination will be held in various cities throughout the country, April 29. *Oral (Group A and Group B candidates).* New York, June 10. Sec., Dr. C. Guy Lane, 416 Marlborough St., Boston.

AMERICAN BOARD OF OPHTHALMOLOGY: San Antonio, Texas, Nov. 12; Philadelphia, June 10. Sec., Dr. William H. Wilder, 122 S. Michigan Blvd., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: San Antonio, Texas, Nov. 13. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

ARIZONA: *Basic Science.* Tucson, Dec. 18. Sec., Dr. Robert L. Nugent, Science Hall, University of Arizona, Tucson.

ARKANSAS: *Basic Science.* Little Rock, Nov. 5. Sec., Mr. Louis E. Gebauer, 701 Main St., Little Rock. *Regular.* Little Rock, Nov. 12. Sec., Dr. A. S. Buchanan, Prescott. *Eclectic.* Little Rock, Nov. 13. Sec., Dr. L. L. Marshall, 820 W. 14th St., Little Rock. *Homeopathic.* Fayetteville, Nov. 13. Sec., Dr. Allison A. Pringle, Eureka Springs.

CALIFORNIA: *Reciprocity.* Los Angeles, Dec. 5. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

CONNECTICUT: *Regular.* Hartford, Nov. 13-14. *Endorsement.* Hartford, Nov. 27. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden. *Homeopathic.* New Haven, Nov. 13. Sec., Dr. Edwin C. M. Hall, 82 Grand Ave., New Haven.

DELAWARE: Wilmington, Dec. 11-13. Sec., Dr. Harold L. Springer, 1013 Washington St., Wilmington.

FLORIDA: Tampa, Nov. 12-13. Sec., Dr. William M. Rowlett, Box 786, Tampa.

KANSAS: Topeka, Dec. 11-12. Sec., Dr. C. H. Ewing, Larned.

KENTUCKY: Louisville, Dec. 4-6. Sec., State Board of Health, Dr. A. T. McCormack, 532 W. Main St., Louisville.

MAINE: Portland, Nov. 13-14. Sec., Board of Registration of Medicine, Dr. Adam P. Leighton Jr., 192 State St., Portland.

MARYLAND: *Regular.* Baltimore, Dec. 11-14. Sec., Dr. Henry M. Fitzhugh, 1211 Cathedral St., Baltimore. *Homeopathic.* Baltimore, Dec. 11-12. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, Nov. 13-15. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 144 State House, Boston.

NATIONAL BOARD OF MEDICAL EXAMINERS: *Parts I and II.* The examinations will be held in medical centers where there are five or more candidates, Feb. 13-15. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

NEBRASKA: Lincoln, Nov. 22-23. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

NEVADA: Carson City, Nov. 5. Sec., Dr. Edward E. Hamer, Carson City.

NORTH CAROLINA: *Endorsement.* Raleigh, Dec. 3. Sec., Dr. Benj. J. Lawrence, 503 Professional Bldg., Raleigh.

OHIO: Columbus, Dec. 3-6. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: *Reciprocity.* Oklahoma City, Dec. 11. Sec., Dr. J. M. Byrum, Mammoth Bldg., Shawnee.

OREGON: *Basic Science.* Portland, Nov. 17. Sec., Mr. Charles D. Byrne, University of Oregon, Eugene.

SOUTH CAROLINA: Columbia, Nov. 13. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

TEXAS: Galveston, Nov. 20-22. Sec., Dr. T. J. Crowe, 918 Mercantile Bank Bldg., Dallas.

VIRGINIA: Richmond, Dec. 12-14. Sec., Dr. J. W. Preston, 803 Medical Arts Bldg., Roanoke.

WISCONSIN: *Basic Science.* Milwaukee, Dec. 15. Sec., Prof. Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee.

Missouri June Examination

Dr. E. G. McGaugh, State Health Commissioner, reports the written examination held in St. Louis, June 14-16, 1934. The examination covered 14 subjects. An average of 75 per cent was required to pass. One hundred and seventy-four candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
University of California Medical School		(1934)	83.3
George Washington University School of Medicine		(1934)	88
Howard University College of Medicine		(1933)	81.4, 82, 82.5, 83.8, 85.1, 88.1
Loyola University School of Medicine		(1934)	82.5
Northwestern University Medical School		(1934)	87.7
University of Illinois College of Medicine		(1933) (1934)	85.4, 80.5, 83, 85.4
University of Kansas School of Medicine		(1933) (1934)	83.8, 84, 87.8
University of Louisville School of Medicine		(1934)	84.2, 86
Harvard University Medical School		(1932)	85
St. Louis University School of Medicine		(1932) (1933)	83.3, 81.7, (1934) 79.3, 79.3, 79.5, 80.6, 80.7, 80.9, 81.3, 81.3, 81.6, 81.7, 81.8, 82, 82, 82.1, 82.4, 82.6, 82.7, 82.7, 82.7, 82.7, 83.1, 83.2, 83.4, 83.4, 83.4, 84, 84, 84, 84.1, 84.1, 84.2, 84.2, 84.2, 84.3, 84.3, 84.4, 84.5, 84.5, 84.7, 84.8, 84.9, 85, 85.3, 85.3, 85.3, 85.4, 85.4, 85.5, 85.6, 85.6, 85.7, 85.7, 85.7, 85.8, 86, 86.1, 86.3, 86.8, 87.2, 87.6, 87.7, 87.7, 88, 88.1, 88.2, 88.5, 88.9, 89.8, 90.3, 90.6, 91
Washington University School of Medicine		(1934)	79.6, 81, 81, 81.9, 82, 82.1, 82.1, 82.4, 82.5, 82.5, 82.8, 83, 83, 83, 83.1, 83.2, 83.2, 83.6, 83.7, 83.8, 83.9, 84, 84.1, 84.1, 84.3, 84.5, 84.5, 84.6, 84.8, 85, 85.1, 85.2, 85.2, 85.2, 85.2, 85.3, 85.5, 85.7, 85.8, 85.9, 86, 86, 86, 86.5, 86.5, 86.5, 86.5, 86.6, 86.7, 86.7, 86.9, 87, 87, 87.1, 87.2, 87.4, 87.7, 87.9, 87.9, 88, 88, 88.1, 90.2, 90.9
University of Nebraska College of Medicine		(1933)	84.2, 86.7, (1934) 84.7, 88
Cornell University Medical College		(1933)	82
University of Oklahoma School of Medicine		(1932)	84.1
Medical College of the State of South Carolina		(1932)	86.4
Meharry Medical College		(1933)	83.6, 86.2
University of Tennessee College of Medicine		(1933)	86
University of Wisconsin Medical School		(1933)	79, 85.5
University of Toronto Faculty of Medicine		(1931)	88.2
Johann Wolfgang Goethe-Universität Medizinische Fakultät, Frankfurt-am-Main, Germany		(1933)*	82
Ludwig-Maximilians-Universität Medizinische Fakultät, München		(1933)*	87.2
Universität Heidelberg Medizinische Fakultät		(1929)	83
Université de Genève Faculté de Médecine		(1933)*	83.2

* Verification of graduation in process.

Iowa Reciprocity and Endorsement Report

Mr. H. W. Grefe, director, Division of Licensure and Registration, reports 9 physicians licensed by reciprocity and 1 physician licensed by endorsement from May 15 to July 12, 1934. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
College of Physicians and Surgeons of Chicago		(1911)	Illinois
Northwestern University Medical School		(1934)	Illinois
Rush Medical College		(1928), (1934)	Illinois
Washington University School of Medicine		(1930)	Missouri
Creighton University School of Medicine		(1933)	Nebraska
University of Nebraska College of Medicine		(1925) (1932)	Nebraska, New York
Marquette University School of Medicine		(1932)	Wisconsin

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Johns Hopkins University School of Medicine		(1927)	N. B. M. Ex.

Texas June Report

Dr. T. J. Crowe, secretary, Texas State Board of Medical Examiners, reports the written examination held in Fort Worth, June 21-23, 1934. The examination covered 12 subjects and included 120 questions. An average of 75 per cent was required to pass. One hundred and fifty-five candidates were examined, 153 of whom passed and 2 failed. Sixty-seven applicants were licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
University of Arkansas School of Medicine		(1934)	84.6
Rush Medical College		(1933)*	86.8
Tulane University of Louisiana School of Medicine		(1934)	81, 82.6, 83, 85.2, 87.4, 87.9, 90.3
Harvard University Medical School		(1930)	88.3
Washington University School of Medicine		(1926) (1931)	92, 83.2
University of Nebraska College of Medicine		(1933)	86.6
Jefferson Medical College of Philadelphia		(1934)	85.3
University of Pennsylvania School of Medicine		(1934)	87.6
University of Tennessee College of Medicine		(1934)	82.6
Baylor University College of Medicine		(1933) (1934)	86.3, 78.5, 79.1, 80, 80.5, 80.9, 80.9, 80.9, 81, 81.3, 81.5, 82.1, 82.3, 82.3, 82.4, 82.5, 82.6, 82.8, 82.8, 82.9, 83, 83.1, 83.2, 83.5, 83.5, 83.7, 83.8, 84.1, 84.1, 84.2, 84.2, 84.3, 84.6, 84.6, 84.6, 84.7, 84.7, 84.9, 84.9, 85, 85, 85.1, 85.3, 85.6, 85.8, 86.1, 86.3, 86.3, 86.5, 86.5, 87.3, 88.2, 88.3, 88.4, 88.5, 88.5, 88.6, 88.8, 90, 90.6, 91.4
University of Texas School of Medicine		(1933) (1934)	85, 78.8, 79, 79.4, 79.9, 80.5, 80.9, 81, 81.4, 81.4, 81.9, 82, 82.3, 82.4, 83, 83.1, 83.1, 83.3, 83.6, 83.6, 83.8, 83.8, 83.8, 83.9, 84, 84.2, 84.4, 84.5, 84.5, 84.6, 84.6, 84.8, 85, 85.1, 85.1, 85.2, 85.3, 85.4, 85.5, 85.5, 85.6, 85.7, 85.8, 85.8, 85.9, 86, 86.4, 86.4, 86.4, 86.5, 86.6, 86.6, 87, 87.2, 87.6, 87.7, 88, 88, 88.1, 88.1, 88.2, 88.2, 88.3, 88.4, 88.7, 89.3, 89.5, 89.5, 90.5,†
Osteopaths			82, 84.2, 84.5, 86, 86, 90.3

	FAILED	Per Cent
Osteopaths		71.6, 72.9

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
University of Arkansas School of Medicine		(1933, 2)	Arkansas
Denver and Gross College of Medicine		(1904)	Idaho
University of Colorado School of Medicine		(1927) (1932)	Colorado, Washington
George Washington University School of Medicine		(1929)	Washington
Bennett Medical College, Chicago		(1912)	Nebraska
College of Physicians and Surgeons of Chicago		(1901)	Michigan
Loyola University School of Medicine		(1928)	Illinois
Northwestern University Medical School		(1911), (1927)	Illinois
Rush Medical College		(1907)	Illinois
School of Medicine of the Division of the Biological Sciences		(1932)	Illinois
Drake University College of Medicine, Iowa		(1904)	Iowa
State University of Iowa College of Medicine		(1931)	Iowa

University of Louisville School of Medicine.....(1925) Kentucky, (1932) West Virginia
Tulane University of Louisiana Medical Department..(1897) Louisiana
Tulane University of Louisiana School of Medicine..(1914) California, (1925) Mississippi, (1918), (1925), (1927), (1928), (1932, 3), (1933, 4) Louisiana
Johns Hopkins University School of Medicine.....(1927) Oklahoma, (1928) Maryland
Harvard University Medical School.....(1929) Maine
Detroit College of Medicine .....(1911) Michigan
University of Michigan Medical School.....(1921), (1924) Michigan
University of Minnesota Medical School .....(1930) Minnesota
University Medical College of Kansas City, Missouri.(1907) Missouri
Washington University School of Medicine .....(1903) Illinois, (1929) Minnesota
Creighton University School of Medicine.....(1932) Kansas
Bellevue Hospital Medical College.....(1896) Illinois
University of Cincinnati College of Medicine.....(1931) Ohio
University of Oklahoma School of Medicine.....(1929), (1930, 2), (1933, 2) Oklahoma
University of Pennsylvania School of Medicine.....(1927), (1930) Pennsylvania, (1932) North Carolina
Meharry Medical College.....(1933) Kansas, Tennessee
University of Tennessee College of Medicine.....(1932) Tennessee
University of Texas School of Medicine.....(1932) Louisiana
University of Virginia Department of Medicine.....(1929)W. Virginia
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin .....(1932) Maryland
Rheinische Friedrich-Wilhelms-Universität Medizinische Fakultät, Bonn.....(1920)‡ New York
Osteopaths .....California, 2, Illinois, 2, Michigan, Missouri, 3

* This applicant has completed his medical course and will receive his M.D. degree on completion of internship.

† No average grade reported.

‡ Verification of graduation in process.

Book Notices

The Treatment of Injuries of the Head and Spine. By Jewett V. Reed, M.D. Paper. Pp. 96, with 39 illustrations by the Department of Illustration, Indiana University School of Medicine. Indianapolis: C. E. Pauley & Company, Inc., 1934.

In this monograph Reed's object is to "set forth in the shortest and simplest manner the method and procedure of treatment of injuries to the brain and spinal cord." He accomplishes his purpose. The work is divided into two parts, part one dealing with head injuries and part two with injuries to the spine. Under head injuries the author briefly reviews the pathology and probable mechanism of production of skull fractures and discusses more extensively the symptomatology and treatment. The operative treatment of compound skull fractures and of middle meningeal hemorrhage is presented in detail and well illustrated. In conclusion Reed states that the "treatment of 90 per cent or more of all head injuries is entirely a medical rather than a surgical problem." Injuries to the spine are divided into two groups, fracture and dislocations of the vertebrae that result in injury of the spinal cord and, second, injuries of the vertebral processes and bodies without cord involvement. On account of the inability to differentiate clinically between laceration and simple pressure on the spinal cord, the author advises laminectomy "as soon as the patient has recovered from shock" in all cases of spinal injury with paralysis. The treatment of fractures of the vertebrae, such as of the transverse and spinous processes, and of the bodies of the vertebrae, not complicated by paralysis, is briefly reviewed and accompanied by illustrations of a "method of obtaining hyperextension and manipulation of compression fractures of the vertebral bodies" and of a method of reduction of cervical dislocations without paralysis. This monograph is of value as a quick reference work for medical students and the physicians and surgeons who administer the immediate treatment to patients with injuries to the head and spine.

Nuevas prácticas de farmacia: Farmacotecnia. Por J. F. de Casadevante, farmacéutico. Prólogo del Dr. M. M. Maestre Ibáñez, farmacéutico de la Beneficencia Provincial. Paper. Price, 25 pesetas. Pp. 411, with 54 illustrations. Madrid: Javier Morata, 1934.

This book, written at the request of the author's numerous colleagues, aims to present accurate, reliable and rapid methods for the scientific preparation of pharmaceutic products. It does not pretend to be comprehensive but includes all that is necessary for the daily problems of the practicing pharmacist, especially methods for the preparation and conservation of medicaments. Because it is designed for the practical pharmacist, the author does not include biologic testing; but he tells where such methods of testing may be found. The book gives the impression of having completely and satisfactorily fulfilled the aims of the author. He does not discuss therapeutics but writes purely for the pharmacist and those interested in pharmacy. A good index is included. If one may judge the condition of Spanish medicine from this treatise on pharmacy, it is modern and progressive.

Laboratory Manual of Biological Chemistry with Supplement. By Otto Folin, Hamilton Kuhn Professor of Biological Chemistry in Harvard Medical School. Fifth edition. Cloth. Price, $3. Pp. 368, with 9 illustrations. New York & London: D. Appleton-Century Company, Incorporated, 1934.

This well known laboratory guide, beginning as a manual for medical students in Harvard Medical School, has now grown into a standard book of procedure for clinical laboratories the world over. The present edition has been rewritten in many sections and one finds many answers where questions existed in former editions. The most important additions to the book are three micro methods for the determination of sugar, nonprotein nitrogen and uric acid in the blood, and a revised method for the determination of creatinine in the blood. A number of new methods have been substituted for old ones; for example, the method of Fiske and Logan for calcium and magnesium in the urine is substituted for that of McCrudden. One finds added a new method for the determination of potassium in the urine, total fixed base, ammonia and potassium in the blood, and for treatment of unlaked blood. There are numerous slight modifications in various methods and several new illustrations. One finds a few omissions, which for completeness should be included; for example, tests for sulphates, sodium and carbon dioxide combining power in the blood. The manual is so familiar as to need no general comments as to its excellence or to call attention to the fact that the methods for the most part are those which have been developed by Folin and his students. The book is interleaved with blank pages for notes.

Les syndromes ménièriques. Par S. H. Mygind et Dida Dederding. No. 26, Monographies oto-rhino-laryngologiques internationales. Publiées par M. Vernet, L. Ledoux, G. Portmann, H. Aloin et M. Sourdille. Analyses en Allemand et Anglais. Paper. Price, 40 francs. Pp. 273. Paris: Les Presses Universitaires de France, 1934.

This monograph considers in detail the Ménière syndrome, covering practically every phase, both anatomic and clinical. Among the subjects discussed are the anomalies of the vestibular function, the cerebral nervous phenomena, tinnitus aurium, and the diagnosis and the treatment of Ménière's disease. The authors, especially Dederding, have done an enormous amount of experimental work. The question of the influence of water intake and its effects on various functions of the ear forms an important phase of the consideration of Ménière's disease in the present publication. There are appended summaries of the book in German and in English, and these are of great value to those who are unable to read French. A rather comprehensive bibliography is also given. The monograph is printed in large type, illustrated with a number of tables and audiometric charts, and is written in a clear, easily understood style. While some of the conclusions of the authors may not in the last analysis prove to be entirely correct, the book as a whole is a valuable contribution to the subject and should prove of definite value to the many clinicians who are confronted with the various phases of Ménière's disease.

Nursing Procedures. School of Nursing, Philadelphia General Hospital. Fifth edition. Cloth. Price, $3. Pp. 256, with illustrations. Philadelphia, 1934.

The original edition of this book was the work of those concerned with the teaching of student nurses in the Philadelphia General Hospital. It was originally intended for the use of those connected with school, but because of its excellent organization and valuable data the book proved useful in other training schools. The present revised edition has been organized to meet requirements of increased ward instruction. The drawings of the various trays to be set up help the student to visualize her work. The material is clearly and concisely presented and, while it is specifically adapted for students of the Philadelphia General Hospital School of Nursing, it should prove a valuable book in any nurses' training school library.

Die Zuckerkrankheit: Leitfaden für Studierende und Ärzte. Von Ferdinand Bertram, leitender Arzt der II. medizinischen Abteilung des allgemeinen Krankenhauses Barmbeck, Hamburg. Boards. Price, 5.80 marks. Pp. 94, with 15 illustrations. Leipzig: Georg Thieme, 1934.

This is written in the best traditional German style, concise, readable, suggestive. Keen observation and an intimate knowledge of the German literature are apparent throughout, although no mention is made of Magnus Levy's epoch-making work on diabetic coma and his demonstration of the low excretion of sodium chloride, or to Umber's (Grote's?) patients who showed over 50 per cent heredity. References to non-Germans are scanty, and German references alone are included in the monographs cited at the end of the volume.

Diabetes is defined as a chronic disease of the entire neuroendocrine apparatus in which a lowered function of the pancreas stands in the foreground. Lack of insulin leads to inability to burn carbohydrate sufficiently and build it up anew into reserve material. Liver glycogen stands in the center of the problem of diabetes; when exhaustion of the glycogen reserve occurs, the combustion of fat suffers, leading to acidosis, which, according to Bertram's conception, is decisive for the fate of the diabetic patient. A glycogen-free liver can result from untreated diabetes or hypoglycemia and therefore is present during an insulin reaction, at which time acidosis is said to appear, although the latter statement is not supported with sufficient data. He ascribes the complications of diabetes to acidosis rather than to hyperglycemia and explains these first by impairment of the action of insulin due to lowering of the alkalinity of the blood, and secondly, because acidosis exerts a harmful action on cell function, as shown by a diminished formation of antibodies. Although fully realizing the usefulness of glycogen in the liver, the author overlooks its undoubted usefulness in the skin and the probability that its replacement there by dextrose has much to do with the dermatologic complications of the disease.

Bertram's conception of traumatic diabetes is sound and he requires as a sine qua non an injury to the pancreas in a proved nondiabetic patient; but he demands also a nondiabetic heredity, which seems hardly justifiable, because, just as obesity and occasionally an infection can arouse a dormant diabetic state, so too might an injury to the pancreas.

Treatment likewise is orthodox, based on an accurate diet to be scrupulously followed even though insulin is added. The carbohydrate in his diet follows a middle course. No sympathy is shown for Stolte's free feeding, particularly with adults. Bertram seldom gives more than the equivalent of 8 bread units each weighing 20 Gm. (12 Gm. of carbohydrate) with 5 per cent vegetables, making a total of from 90 to 120 Gm. of carbohydrate. Fruits are favored because of their content of vitamins, alkalis and levulose. Protein is prescribed in moderate quantities. At the beginning of treatment the fat and also calories in the diet are low and the carbohydrate relatively high not only to guard against acidosis but also because a diabetic patient should never be overfed, since it is not a matter of indifference to the pancreas whether it lives with a body of 60 or of 90 Kg.—a neat adoption of Allen's teaching, although no appreciation is evident of Du Bois and Richardson's demonstration that a low diet may be a high fat diet and that it is the total calories burned, not fed, which count.

Success in treatment is best measured by the patient's subjective feeling of good health and in second degree by the permanent retention of an adequate glycogen reserve rather than by the state of the blood and urine. A sugar free urine and a normal blood sugar are not considered necessary, or perhaps desirable, on the basis that a high blood sugar in diabetes may act as a compensatory offset to the loss of power of utilization of sugar by the tissues, thus enabling the cells of the body to store and utilize glycogen more easily. Shades of Naunyn! Somehow he does not quite catch the point that the diabetic patient who feels better on a free diet, like the man who takes a drink, may be helped only temporarily and that it is really possible for the diabetic patient whose blood sugar is normal, just like the man who does not drink, to maintain perfect health.

Pathology is dismissed with four short paragraphs in fine print, and diabetes in childhood occupies one page. Diabetic retinitis is an entity and with prolonged treatment may improve. Operations for gallstones are advisable as prophylaxis against diabetes.

Classification is based on the relation of carbohydrate tolerance to ketone bodies. The person with mild diabetes is continuously free from ketone bodies on an adequate caloric diet containing at least 100 Gm. of carbohydrate; the patient with moderately severe diabetes is likewise ketone free on such a diet with the use of insulin; but the patient with severe diabetes is not ketone free on such a diet even with insulin. Obviously Americans would not subscribe to that classification. In a brief paragraph the author beautifully summarizes the somewhat complicated and confused types of sthenic and asthenic diabetes.

According to Bertram, insulin should be given only when prolonged dietetic treatment fails, in contradistinction to the American idea that not until the disease is arrested should one attempt to do without it. Another fundamental difference between Bertram's treatment and American treatment is that he forbids the examination of the urine by the patient under all circumstances. As the number of his diabetic children increases, it is probable that he will revise his attitude in both cases. What would our thousands of diabetic children do, wandering all over the United States for school and work, if they did not know how to examine their urine and guide their own treatment? Rightly the author counsels against making neurasthenics of diabetic patients. He centers his treatment on acidosis, but in America it is a sine qua non at the outset of treatment to teach patients that acidosis and diphtheria are similar and that it is a disgrace for a person with diabetes to have either one or the other. Had American doctors only the problem of preventing acidosis, the treatment of diabetes would be simple. Today treatment should strive for the preservation of the health of the patient after he has had the disease ten, fifteen and twenty years or more, because the latter period is the probable duration of diabetes for the average patient who contracts it in the year 1934.

Valuable is Bertram's pointing out that, if too great doses of insulin are given, serious harm can result either by a rapid fall of the blood sugar or by the inducement of too strong a counter regulation, especially manifested by an increased discharge of epinephrine with the consequent rise in blood sugar, impoverishment of glycogen and increase of acidosis. This increased discharge of epinephrine is measurable clinically by a rise in blood pressure and the appearance of a lymphocytosis reaching 60 per cent. The experiments of von Holm are cited in which a continuous weak infusion of insulin was injected into an animal and shown to be far more efficacious than when given in a single dose. Thus, reckoned in terms of a diabetic patient of 60 Kg. body weight with assumed complete loss of endogenous insulin, 7.8 units would keep the urine sugar free fasting, and 48 units if the total caloric needs are wholly replaced by dextrose. He favors doing without insulin if in any way possible and then proves that exactly the opposite course should be followed, by reporting wonderful results with insulin in two patients who obviously needed it months and even years before.

The treatment of coma is sound and he has treated more than 200 cases. He employs intravenous injections of dextrose freely, from 1 to 3 Gm. per unit. In America there is a difference of opinion on this point, but all schools agree that dextrose should be given to a patient with diabetes if he has been without food twelve hours, just as surgeons administer dextrose to persons who do not have diabetes. Insulin is recommended in half hourly doses, from 20 to 50 units, seldom more, and in severe cases intravenously as well as subcutaneously; the early doses should be the larger. Highly concentrated 50 per cent solutions of dextrose are employed in preference to weaker strength, as he wishes to guard against cardiac collapse. Subcutaneously 4.6 per cent dextrose solution is employed and also salt solution. He fully appreciates the advantage of 10 per cent salt solution when uremia threatens through deficiency in salt. As for alkali therapy, the maximum dose is 20 Gm. of sodium bicarbonate and this only when the carbon dioxide is extremely low; even then it should be cautiously and slowly injected because of the oft appearing necrosis that it may entail.

For the circulation he utilizes drugs many of which will sound bizarre to American readers, sympatol, cardiazol, coramin, caffeine, strychnine and hexaton. Because of the disturbed circulation following coma he prescribes from eight to ten days' absolute rest in bed, advice rarely necessary with American methods of treatment. The frequency of urobilinogen in coma is recorded.

Infection is the complication most to be feared, because of the injury to the pancreas through toxins, through reduction of insulin activity due to the accompanying acidosis, and, third, by tryptic ferments found in the leukocytes. The seriousness of an infection in the patient with diabetes he explains by the lowered vitality of the body and its diminished power for antibody formation, made evident by hyperglycemia and acidosis.

The danger of tuberculosis in diabetic patients is fully appreciated, particularly as a sequel to coma, but contrary to American experience he has seldom encountered severe acidosis in tuberculosis.

Coma is classified into three types, the typical Kussmaul dyspneic coma, cardiovascular coma and renal coma, although he recognizes that the types intermingle. Many will disagree with Bertram that coma sometimes develops without recognizable causes or that it develops in the course of one or two hours or even a shorter period. The unreliability of dependence on laboratory tests for the prognosis in coma is rightly emphasized, as also the importance of the blood pressure and its treatment. Despite his use of dextrose, Bertram records five cases in which hypoglycemic collapse following coma led to sudden failure of the circulation. This is what surgeons fear when dextrose is given to patients with diabetes. These facts show that the more frequent use of micro blood sugar tests should be made, because they would avert such catastrophes. To give dextrose to offset the danger of insulin and then to rely only on tests of the urine is almost like jumping from the frying pan into the fire.

Bertram holds that, even if of moderate degree, diabetes is an absolute indication for interrupting pregnancy and at the same time for sterilization to protect the mother and to stop hereditary transmission. Diabetic patients desiring marriage should be registered at the heredity bureau. Would our 400,000 living diabetic patients and their 800,000 brothers and sisters who also carry the disease take kindly to registration, leaving to officials to decide whether they should marry? An experiment on a national scale to interrupt all diabetic pregnancies and sterilize all diabetic patients is unique, and the rest of the world will watch it with interest; but it is a question whether France will care to adopt it and thus run the risk of losing another Clemenceau and another Joffre, whose diabetes even without insulin did not appear to be a great handicap to their careers, or whether we would wish to miss the chance of losing another Edison or the discoverer of the cure of one of the three diseases for which this century is famed.

The book is instructive and stimulating and it is delightful to have an author leave the beaten path and force the reader to reconsider his own "principles of action and to give the reasons for the same in each case."

A Compend of Diseases of the Skin. By Jay Frank Schamberg, A.B., M.D., Professor of Dermatology and Syphilology, Graduate School of Medicine, University of Pennsylvania, and Carroll S. Wright, B.S., M.D., Professor of Dermatology and Syphilology, Temple University School of Medicine. Ninth edition. Cloth. Price, $2. Pp. 331, with 129 illustrations. Philadelphia: P. Blakiston's Son & Co., Inc., 1934.

The ninth edition of this compend has been revised and enlarged, and it "is designed for the use of practitioners and students, as a rapid reference work and key to the study of dermatology." The common skin conditions are succinctly described, and there are excellent tables detailing the differential diagnosis of the more important skin conditions that are easily confused clinically. The treatment of the more important conditions is briefly but clearly discussed. The article on syphilis is excellent, and the concise discussion on treatment is unusually complete when one considers its brevity. The work serves a useful function as an outline of study for the student but must be supplemented by the larger dermatologic textbooks for more detailed discussion of the subject. Figure 67 (p. 181), labeled chloasma, is more probably one of vitiligo. Figure 101 (p. 257) should more properly be labeled maculopapular syphilis. In the article dealing with x-rays, on page 311, the old MacKee formula is given instead of that given in his latest textbook. In the preface to this edition, comment is made that "material on lymphogranulomatosis cutis, a relatively new disease, has been introduced," when lymphogranuloma inguinale is meant.

Œuvre scientifique de J. Babinski. Recueil des principaux travaux publié par les soins de J. A. Barré et al. Paper. Price, 180 francs. Pp. 638, with 69 illustrations. Paris: Masson & Cie, 1934.

During the fifty years from 1882 to 1932 Babinski alone and in collaboration with his pupils published 288 articles, which are listed at the end of this volume. Seventy-nine articles, arranged in eleven groups, have been selected for reproduction. Among them are those dealing with the discovery of the Babinski sign and Babinski's conception of hysteria and hypnotism. Almost every aspect of clinical neurology is covered, and the volume gives in convenient form not only the chief works of this master but a clear view of the progress of neurology in the most eventful fifty years of this department of medicine.

The Spastic Child: A Record of Successfully Achieved Muscle Control in Little's Disease. By Marguerite K. Fischel. Cloth. Price, $1.50. Pp. 97, with illustrations. St. Louis: C. V. Mosby Company, 1934.

This monograph is a unique and valuable contribution to medical literature. While the book is a written record of a mother's attempt to teach muscle control to her child with Little's disease, it is replete with medical as well as human interest. The methods and accessory aspects of treatment are described in simple and accurate language. Valuable points are intimately discussed which should serve a most useful purpose to those faced with similar problems. The presentation is concise, and yet the medical reader will be impressed with a wealth of valuable data that this record contains. The book will serve as a valuable document of what can be accomplished with a handicapped child by an ingenious and persevering mother.

Manual de medicina clinico y de laboratorio. Por el Dr. C. M. Desvernine y Galdos, de las Facultades de New York, Paris y Madrid. Paper Pp. 568. Habana: Cultural, S. A., 1933.

This large volume is a glossary of medical terms and differs from the usual dictionary in that the definitions are more lengthy and descriptive. The medical words are classified into groups comprising medical diseases, medical phenomena, signs, reflexes, syndromes, and laboratory and surgical procedures. The authors use the proper names of the various terms in the great majority of instances and list these in alphabetical order in their respective groups. The book is divided into ten parts. The first part, which constitutes almost half of the volume, is a glossary of medical diseases. The remaining nine parts list the various phenomena, syndromes, signs, and so on, in a fashion similar to the first portion.

The Care and Feeding of Children: A Catechism for the Use of Mothers and Children's Nurses. By L. Emmett Holt, Jr., M.D., Associate Pediatrician to the Johns Hopkins Hospital, Baltimore, Md. Fifteenth edition. Cloth. Price, $1.25. Pp. 259. New York & London: D. Appleton-Century Company, Incorporated, 1934.

This little volume has been a standard guide in the care and feeding of children for more than thirty years. Its popularity is well merited, for it is carefully organized to meet the little daily problems that arise with the inexperienced mother. The present revision brings the book down to date with enlightened medical opinion. For a concise textbook considering the care and needs of the well child, this volume has no equal.

A Suggestive Budget for Families of Low Income. Prepared by the Budget Committee of the Family Welfare Committee and the Housing Committee of the Washington Council of Social Agencies. Paper. Price, 35 cents. Pp. 46. Washington, D. C., 1934.

This is issued to offer a guide for relief workers in estimating individual or family needs. It is detailed as to items of diet for persons under various circumstances. Housing and clothing needs are also itemized. In the summary, the total estimated amount needed for "the basic needs of families of low income permitting a limited choice as to quality" is $1,921.14. A second budget "provides only for the basic needs of families of low income" and is estimated at $1,291.40.

Fuss und Bein: Ihre Erkrankungen und deren Behandlung. Ein Lehrbuch. Von Prof. Dr. med. Georg Hohmann, Direktor der Orthopädischen Universitäts-Klinik, Frankfurt a. M. Second edition. Paper. Price, 24 marks. Pp. 380, with 326 illustrations. Munich: J. F. Bergmann, 1934.

This combines the well known works of the author on the foot and the leg. The monograph is complete, including deformities and disabilities of the foot and the leg, all of which are described and illustrated by line drawings, roentgenograms and operative technic. The book that can be recommended to all surgeons who read German.

Medicolegal

Dental Practice Acts: Filing of Charges Condition Precedent to Revocation Proceedings.—The Illinois Department of Registration and Education, without any formal charges having been first filed with it, instituted revocation proceedings against Kalman, Niedermeyer and another, all licensed dentists employed by the Chicago Dentists. The department served notice on each of the dentists that on a stated day it would investigate his actions to determine whether or not he had obtained money by false or fraudulent representations or had been guilty of dishonorable conduct or of certain other unprofessional acts. The three dentists then filed a bill in the superior court, Cook County, to enjoin the department and its dental committee from proceeding further in the matter. The court sustained a demurrer interposed by the defendants and dismissed the bill, whereupon Niedermeyer appealed to the Supreme Court of Illinois.

The Illinois Civil Administrative Code, as amended, defines the procedure to be followed in revoking a license to practice dentistry, as also does the Illinois dental practice act. The Civil Administrative Code provides that the department "may upon its own motion and shall upon the verified complaint in writing of any person" initiate revocation proceedings. On the other hand, the dental practice act, prior to February 1933, provided, in part, as follows:

> The board [meaning the Department of Registration], when written charges have been filed with its secretary, and seem sustained by proof, shall fix a time and place for the examination of a person so charged and shall give written notice to the said person of the time and place and furnish him with a copy of the charges. . . .

For the reasons stated in *Schireson* v. *Walsh,* 187 N. E. 921 (THE JOURNAL, Aug. 4, 1934, p. 367) the Supreme Court held sections 60(a)—60(1) of the Civil Administrative Code unconstitutional as applied to dental practitioners. The department, the court held, in proceedings to revoke a license to practice dentistry, must follow the procedure laid down in the dental practice act as it existed at the time of the alleged professional misconduct on the part of Niedermeyer, namely, prior to February 1933.

The right to practice dentistry, said the Supreme Court, is a valuable right, a property right within the due process of law clause of the constitution. Revocation of a license to practice dentistry not only carries with it disgrace and humiliation but deprives the licentiate of his means of earning his livelihood. In a proceeding of this nature due process of law requires a definite charge, adequate notice and a full, fair and impartial hearing. While it is not necessary that charges of professional misconduct should be drawn with the same accuracy and certainty as an indictment or information in a criminal case or with the refinements of pleadings in courts of record, yet such charges should be so drawn as to bring the alleged act of misconduct clearly within the purview of the statute and should specify the time and place when and where such prohibited act was committed. The right to proper notice and a sufficient and explicit charge is not procedural but substantive. The supposed charge in this record shows that the contemplated hearing was a hearing in the nature of an inquisition similar to an investigation by a grand jury. This is not the hearing that is provided by the statute. Neither the dental committee nor the department has the power, under the statute, to originate or prefer charges against a dental practitioner. The charges against Niedermeyer, in order to confer jurisdiction on the dental committee or the department, should have been in writing, filed with the secretary of the committee, and should have contained direct, positive and specific allegations based on the alleged commission by Niedermeyer of some of the acts prohibited by the dental practice act. Under the notice purporting to contain the charges against Niedermeyer and served on him by the department, concluded the court, neither the department nor its dental committee had jurisdiction to conduct the alleged investigation against him or to enter any order revoking or suspending his license.

The Supreme Court, therefore, directed the superior court to overrule the demurrer to the bill.—*Kalman v. Walsh (Ill.), 189 N. E. 315.*

Charitable Hospitals: Liability for Neglect in Selecting Employees.—The appellee, a pay patient in the appellant hospital, a charitable institution, was injured by reason of the negligence of a hospital nurse in giving the patient a vaginal douche. The trial court gave judgment for the appellee and the hospital appealed to the Supreme Court of Appeals of Virginia.

The liability of a charitable hospital for negligent acts of its servants, said the Supreme Court of Appeals, was settled in Virginia in the case of *Weston's Adm'x* v. *Hospital of St. Vincent, etc.,* 131 Va. 587, 107 S. E. 785, 23 A. L. R. 907. In that case, the court held that the only duty which a charitable hospital owed to its patients was the exercise of due care in the selection and retention of its servants. In the present case, continued the court, there was no question that the jury was justified in concluding that the negligence of the nurse was the proximate cause of the patient's injuries. The superintendent of nurses testified that, in selecting a nurse, one of the requirements was that the applicant should have had three years of high school work. The evidence showed that the nurse responsible for the patient's injuries had never attended high school and that she had attained only the tenth grade in a graded school situated in a small town. During the three years that she had been in the hospital, she had been repeatedly reprimanded for infractions of the rules of the hospital, had been threatened with dismissal and had been retained only because the superintendent felt sorry for her. It is not sufficient to say, said the Supreme Court of Appeals, that a nurse is competent simply because she is capable of discharging the manual duties incumbent on her as a nurse. It is a matter of common knowledge that the welfare of a patient is as much the responsibility of the nurse as it is of the physician. If the nurse is lacking in educational preparation, if she is guilty of indiscretions that impair her physical or mental status, if she is lacking in that moral character which imbues the patient with confidence, then it cannot be said that she is a competent person to be placed in charge of a helpless patient.

The finding of the trial court that the hospital was negligent in the selection and retention of the nurse was amply justified by the evidence, concluded the court, and the judgment against the hospital was affirmed.—*Norfolk Protestant Hospital v. Plunkett (Va.), 173 S. E. 363.*

Society Proceedings

COMING MEETINGS

American Society of Tropical Medicine, San Antonio, Texas, November 14-16. Dr. Henry E. Meleney, Vanderbilt University School of Medicine, Nashville, Tenn., Secretary.

Inter-State Postgraduate Medical Association of North America, Philadelphia, November 5-9. Dr. W. B. Peck, 27 East Stephenson Street, Freeport, Ill., Managing-Director.

Pacific Coast Society of Obstetrics and Gynecology, Oakland and Del Monte, Calif., November 21-23. Dr. Clarence A. De Puy, 230 Grand Avenue, Oakland, Secretary.

Puerto Rico, Medical Association of, Santurce, Dec. 14-16. Dr. Julio R. Rolenson, Box 3403, Santurce, Secretary.

Radiological Society of North America, Memphis, Tenn., December 3-7. Dr. Donald S. Childs, 607 Medical Arts Building, Syracuse, N. Y., Secretary.

Southern Medical Association, San Antonio, Texas, November 13-16. Mr. C. P. Loranz, Empire Building, Birmingham, Ala., Secretary.

Southern Surgical Association, Sea Island, Ga., Dec. 11-13. Dr. Robert L. Payne, 142 York Street, Norfolk, Va., Secretary.

Western Surgical Association, St. Louis, December 7-8. Dr. Albert H. Montgomery, 122 South Michigan Boulevard, Chicago, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Periodicals are available from 1925 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama Medical Association Journal, Montgomery

4: 97-128 (Sept.) 1934

Etiology and Symptomatology of Peptic Ulcer. E. S. Sledge, Mobile.—p. 97.
X-Ray Diagnosis of Peptic Ulcer. I. M. Gravlee, Mobile.—p. 99.
Dietary and Medical Management of Peptic Ulcer. S. Harris, Birmingham.—p. 101.
Surgical Treatment of Peptic Ulcer. L. Noland, Fairfield.—p. 111.
Reminiscences. J. M. Whiteside, Anniston.—p. 113.
Volkmann's Ischemic Contracture. S. R. Terhune, Birmingham.—p. 116.

American Journal of Clinical Pathology, Baltimore

4: 381-452 (Sept.) 1934

*One Hour Two-Dose Dextrose Tolerance Test. W. G. Exton and A. R. Rose, Newark, N. J.—p. 381.
Some Medicolegal Aspects of Iso-Agglutinins. H. A. Heise, Milwaukee.—p. 400.
Preparation of Neurologic Material for Histologic Study. J. W. Kernohan, Rochester, Minn.—p. 410.
Further Studies in Antigen Emulsion Preparation for Ball Test for Syphilis. B. S. Kline, Cleveland.—p. 426.
Cyanide Poisoning. A. O. Gettler and A. V. St. George, New York.—p. 429.
Treatment of Malignant Neutropenia by Injection of Liver Extract. W. B. Martin, Norfolk, Va.—p. 438.

One Hour Two-Dose Dextrose Tolerance Test.—Exton and Rose perform the one hour two-dose dextrose tolerance test by dissolving 100 Gm. of dextrose in about 650 cc. of water. This solution is flavored with lemon and divided into two equal doses, which are served cold. Three containers with preservative against glycolysis are kept at hand for the blood specimens and three containers for the urine specimens. When collecting the specimens the subjects should empty the bladder as completely as possible. The following steps are taken after a fast, preferably over night: 1. The samples of blood and urine are collected and the first dose of dextrose is given, from one to two minutes being allowed for its ingestion. 2. Thirty minutes after the ingestion of the dextrose the blood sample is collected and the second dose of dextrose is given, from one to two minutes being allowed for its ingestion. Thirty minutes later, samples of blood and urine are collected. The third urine container is given the subject for a sample of the urine next voided whenever a (post) sample is desired. When the results of the foregoing procedure are plotted, the interpretation of the first part of the curve, that is, the part that includes the original and the thirty minute samples, is exactly the same as the interpretation of the same part of the curve of the older procedure, and the same deductions are drawn accordingly from the blood and urine sugar values. Interpreting results of the second part of the one hour two-dose tests indicates that normal subjects respond to the second dose of dextrose with a greater fall in blood sugar than that occurring during the same period after only a single dose and there is no sugar in the urine. The criteria for determining diabetes in the one hour two-dose test are a more or less steep rise of not less than 10 mg. of blood sugar in the sixty minute sample following the second dose of dextrose and the relation of blood and urine sugar values to the severity of the disease. The criteria of the test for renal glycosuria are: blood sugars that follow the normal course, or in any event never reach the diabetic level, and sugar in both urine specimens. The criteria of alimentary glycosuria are: a sugar-free urine after fasting with sugar in the final urine and blood sugars that follow the normal curve even when the level is higher than normal. Up to the present time the authors have not encountered a single instance in which the new test disagreed with the older when the results of the older test were satisfactory. On the other hand, many cases gave doubtful or misleading responses to the older test when results of the new test were consistent and specific.

American Journal of Surgery, New York

25: 381-564 (Sept.) 1934

Rôle of Chemistry in Obstetrics and Gynecology. H. J. Stander, New York.—p. 383.
Plea for Conscientious Prenatal Care. H. C. Clark, Wichita, Kan.—p. 390.
Postpartum Pyelitis of Pregnancy: Treatment of Certain Cases Without Use of Ureteral Catheter: Explanation Based on Physiology of Bladder. D. K. Rose, St. Louis.—p. 394.
Some Practical Considerations in Treatment of Leukorrhea. A. Reich, New York.—p. 398.
Familial Fibroblastoma of Peripheral Nerves: Report of Two Cases. C. J. Miangolarra and S. M. Copland, New Orleans.—p. 399.
*Acute Fractures of Os Calcis: Their Treatment from Industrial Standpoint. C. R. G. Forrester, Chicago.—p. 404.
Gunshot Wounds of Head in Civil Practice: Note on Management. E. S. Gurdjian and H. Buchstein, Detroit.—p. 414.
*Compression Fractures of Vertebral Bodies: New Method of Attempt at Reduction and Immobilization. V. Parmley, Little Rock, Ark.—p. 419.
*Pyelographic Injection of Perirenal Lymphatics: Report of Two Cases and Review of Literature; Consideration of Relation of Pyelolymphatic Backflow to Chyluria, Anatomy of Lymphatics of Kidney and Mechanism of Backflow from Renal Parenchyma and Pelvis. B. S. Abeshouse, Baltimore.—p. 427.
Nephrostomy in Pyelonephritis. I. R. Sisk, J. B. Wear and E. F. Cummings, Madison, Wis.—p. 451.
Oral Dye Therapy in Urogenital Infections. H. W. E. Walther and R. M. Willoughby, New Orleans.—p. 460.
Associated Renal Tuberculosis and Malignancy. M. R. Keen, Huntington, N. Y.—p. 467.
Avertin Rectal Anesthesia. V. E. Johnson, Pauline Sheppa and Mary Haffey, Atlantic City, N. J.—p. 476.
Splanchnic Anesthesia: Its Importance in Operations of Upper Abdomen. H. Finsterer, Vienna, Austria, and P. Thorek, Chicago.—p. 481.
Pleurolysis: Addition to Thoracoplasty. S. A. Thompson, New York.—p. 487.
Rhinoplasty. G. A. Pagenstecher, San Antonio, Texas.—p. 491.
*Modified Torek Operation. W. L. Wolfson and S. M. Turkeltaub, Brooklyn.—p. 494.
Hypertrophic Pyloric Stenosis in Adult: Discussion and Case Report. R. F. Elmer and C. E. Boylan, Chicago.—p. 499.
Cytologic Response to Peritoneal Irritation in Man: Protective Mechanism. C. F. Dixon, Rochester, Minn., and E. L. Rixford, San Francisco.—p. 504.
Tragedies of Abdominal Incision. J. W. Kennedy, Philadelphia.—p. 512.
*Autogenous Milk Vaccine Therapy in Surgical Treatment of Peritonitis. J. G. Anderson, Westerly, R. I.—p. 521.
Suggestions to Facilitate Use of Surgical Maggots in Suppurative Infections. W. Robinson, Washington, D. C.—p. 525.
Detection of Occult Blood in Feces. E. D. Kiefer, Boston.—p. 530.

Acute Fractures of Os Calcis.—In fractures of the os calcis following the reduction of the swelling, Forrester performs a subcutaneous tenotomy of the achilles tendon, using the zigzag method and taking all pull of the muscle off the distal displaced fragment. Direct traction is used to pull this posterior displaced fragment down as near normal as possible, restoring the original longitudinal arch. The lateral deformities below the malleoli are corrected by utilizing the method devised by Böhler, to which the author has added his knee pressure splint, using the buttons devised by Böhler, and, using them on the same splint, he is enabled to reduce forcibly the bony deformity below the malleoli. After the reduction is made, it is maintained by manual pressure pulling the heel down at the same time. At this point the plantar position of the foot is also maintained by keeping the ball of the great toe in plantar flexion instead of inversion. A stockinet is then applied from the toes up to the knee. A posterior plaster mold is then applied followed by a circular skin-fitting plaster cast in which a walking iron is incorporated. No weight bearing is allowed for the first twenty-four hours or until the plaster has hardened. After that the patients are instructed to walk on the cast without any other assistance and to move the toes frequently each day to prevent any edema. This type of cast is maintained for at least two months. At the end of that time an elastic stocking or an Unna boot is employed for about sixty days, and in the meantime the patient is given education of all leg muscles, together with foot exercises and the ultimate use of the shoe worn previous to the accident. A review of his results in 150 cases indicates that a combination of the author's type of treatment with Böhler's ambulatory cast and walking iron results in a material reduction not only

in temporary disability, which usually runs from a year to a year and a half, but also in the specific loss, which runs from 60 to at least 80 per cent.

Reduction of Compression Fractures of Vertebral Bodies.—Parmley presents a method for the reduction of compression fractures of the thoracic and lumbar vertebrae, together with an improved method of constructing a plaster shell to maintain the corrected position. The patient is anesthetized, and if the fracture is located in the twelfth dorsal or in the first, second, third or fourth lumbar vertebra hyperextension can be obtained best by swinging the patient between two tables, face down, one table beneath his chest and the other beneath the upper third part of his thighs. If the fracture is above the twelfth dorsal vertebra the position is the same except that the table or elevation under the chest is moved upward, toward the shoulders, the neck also being hyperextended by means of elevation or suspension of the head, and that the second table is placed under the hips or pelvis. The elevation of the hips or pelvis should be considerably higher than that of the shoulders. Then a piece of felt is cut to fit the patient's back. This felt should extend from well over the shoulders to about the level of the greater trochanters and to the anterior axillary line on each side. If palpation over the injured vertebra reveals a slight "hump" or prominence, a sand bag about 2 inches thick and about 4 inches broad is placed directly over the injured vertebra and the bag is struck several times with quick sharp blows from the flat surface of a hammer weighing from 2 to 4 pounds. This should be kept up until the "hump" disappears or until it is obvious that there is an impaction of such a degree that it is deemed impossible to break it up. When the reduction is completed, the posterior felt jacket is fitted to the patient and held in position by adhesive plaster. Then, with 6 inch widths, beginning well over the shoulders, plaster bandage is laid transversely. It should be laid smoothly and each fold should go well beyond the margin of the felt. Then the plaster must be rubbed and smoothed to fit every depression and every prominence of the patient's back as perceived through the felt. After this first layer begins to set, others are added longitudinally and obliquely in both directions and again transversely to the number of from twelve to fifteen. When the shell is made, it is allowed to remain on the patient for a few minutes until it hardens. Before the shell becomes hard, it is trimmed to conform to the size of the felt. When the shell has dried thoroughly, a piece of stockinet is stretched over the inner side and held with adhesive plaster, and the patient is placed in the cast. During the time required for the plaster to dry, the patient is kept in bed in the hyperflexed position with Buck's extension in force. He is given one-fourth grain (0.016 Gm.) of morphine sulphate or one-third grain (0.022 Gm.) of pantopon hypodermically every four to six hours to control intestinal peristalsis and muscular contractions. The patient is kept in the shell for a week, not being allowed to turn over or move about. When placed in the shell, he is allowed to flex his knees as he desires. The patient may return home any time after he has been placed in the cast.

Pyelographic Injection of Perirenal Lymphatics.—Abeshouse believes that the phenomenon of pyelolymphatic backflow can be graphically demonstrated by injection of the renal and perirenal lymphatic canals during pyelography. Injection of the renal and perirenal lymphatic canals during pyelography occurs not only in patients with parasitic or nonparasitic chyluria but also in patients with an absence of chyluria or a nondemonstrable chyluria. The author is of the opinion that injection of these lymphatic canals is the result of the easy penetration of the pyelographic medium into anomalous renal lymphatic canals, which may be congenital or acquired. The acquired type of anomalous renal lymphatics, which is usually associated with a chyluria, is exemplified by the dilatation and tortuosity of the renal lymph vessels following an obstruction of the thoracic duct resulting from an inflammatory, suppurative or neoplastic disease in the thoracic, mediastinal, peritoneal or retroperitoneal region. The chyluria is the result of the rupture of one or more of these dilated, tortuous lymph vessels, thus establishing a communication between the renal lymphatics and the pelvis. It is through the same points of rupture that the contrast fluid penetrates and injects the renal and perirenal lymphatics. The congenital type of anomalous renal lymphatics in all probability is present in the cases of injected perirenal lymphatics unassociated with a demonstrable chyluria and in some of the cases of nonparasitic chyluria. In this type, anatomic variations in the course and structure of renal lymphatics may be present and produce a direct communication between the renal lymphatics and the pelvis which will permit the easy penetration of the pyelographic fluid. Overdistention of the renal pelvis and excessive pressure at the time of pyelography play no part in the production of injected renal or perirenal lymphatics. The author bases the foregoing remarks on a study of eleven cases of injected perirenal lymphatics from the literature and two personally observed cases unassociated with a demonstrable chyluria.

Operation for Maldescended Testicle.—To overcome the disadvantages and provide greater postoperative comfort and a shorter period of disability from the Torek operation, Wolfson and Turkeltaub have modified the technic as follows: Over the inguinal canal, hockey-stick shaped incisions, beginning at the pubic area, are made through the skin and the aponeurosis of the external oblique muscle. The broken lines are directed outward and upward. The external abdominal ring is split through at the middle of the intercolumnar fibers. The blades of the aponeurosis are separated widely to permit more mobility and better relaxation of the arched fibers of the internal oblique and transversalis muscle. The gubernaculum testis should be identified and traced to the lower attachment, which is then doubly clamped low down, cut and tied at both ends. The testicle is palpated, viewed, appraised and its relationship studied, and it is lifted if it is covered with a veil of cremasteric muscle. The testicle and the spermatic cord are withdrawn gradually from the inguinal canal. A finger dissection will mobilize this structure from its bindings of cremasteric muscle, adhesions and transversalis fascia, performed by starting posteriorly and working deeply and high up into the retroperitoneal space. Anteriorly and laterally, a similar performance liberates the spermatic cord and the vaginal process from the anterior and lateral walls. The vaginal process or peritoneal tube is freed from the vas deferens and spermatic vessels of the cord. The cord may be lengthened by separating all peritoneal remnants and adventitious tissue between the vas deferens and the spermatic vessels as far down as the testicle and epididymis. If additional length is required, a complete and high dissection of the posterior parietal peritoneum from the spermatic vessels up to the renal area will accomplish the purpose. The new bed for the testicle is prepared by forcing a finger to the bottom of the scrotum. The base of the scrotum is next grasped with two Allis forceps 2 cm. apart. A transverse slit is made through the skin and dartos between the clamps. Another incision, equal in length, parallel but lower, is made on the inner and upper part of the thigh, facing the scrotum. The cord structures are alined correctly. If the length and the position of the testicle in the scrotum are satisfactory, a clamp is passed through the scrotal incision to grasp and withdraw the free end of the gubernaculum testis through the scrotal slit. The testicle is carried to the bottom of the scrotum. A union of the upper skin flap in the thigh to the posterior skin flap of the scrotum is then established with interrupted sutures. The gubernaculum is stitched to the newly formed posterior skin suture line with interrupted fine silk sutures. The skin wound is closed with silk sutures, which also incorporate the gubernaculum to this union. The inguinal canal and structure are reformed and reunited with number 1 catgut sutures. The spermatic cord should not be displaced. Two weeks after the orchiopexy the patient is to resume his physical activities. Two months later the scrotum is detached from the thigh, by incision round the circumference of the scar and through the gubernaculum. A few interrupted sutures close the wounds of the two surfaces. The authors performed this operation with satisfactory results in forty-five cases of maldescended testicle.

Autogenous Milk Vaccine Therapy in Treatment of Peritonitis.—Anderson has been using autogenous milk vaccines in the treatment of peritonitis since 1929. Immediately preceding any abdominal operation, five numbered Erlenmeyer

flasks, each containing 30 cc. of milk, are boiled and sterilized for thirty minutes in an electrical sterilizer and then allowed to cool. A thin skin forming on the surface of the milk is removed with a sterile platinum loop. The sterile flasks are then set aside. If, when the abdomen is opened, a local or general peritonitis is present, cultures are obtained with a sterile spoon or platinum loop. If there is much peritoneal fluid present, about 4 drachms (15 cc.) of the fluid is used to inoculate the milk in each flask. Cultures can also be obtained by dipping the blind end of the appendix after removal into the sterile milk. These flasks are then corked and placed in an incubator at 37.5 C. At the end of twelve hours, flask 1 is removed from the incubator and sterilized by boiling over a direct gas flame for five minutes. If a curd forms either before or after boiling, it is removed by filtering through sterile cotton and the filtrate is used for injection. Flasks 2, 3, 4 and 5 with milk cultures are removed in twenty-four, thirty-six, forty-eight and sixty hours, respectively, treated and injected if deemed necessary as described for flask 1. All milk cultures are killed by heat at the end of an incubation period of four days, as it is the author's opinion that maximal growth has been obtained by that time. Chemical changes occur which retard the growth of the bacteria, and undesirable products of fermentation may result. The filtrates of these four-day cultures are kept in sterile sealed bottles on ice for future use if necessary. Injections are given intramuscularly in the gluteal region. The vaccine material should not be injected directly into the blood stream. If any anaphylactic signs or symptoms appear, 0.6 cc. of epinephrine hydrochloride should be given. The amount of vaccine injected should be determined by the condition of the patient; from 10 to 25 cc. has been employed, usually 15 cc. or more. Two or three injections have been given as a rule. In the author's eighteen cases of appendicitis with localized or generalized peritonitis treated by this method there was only one death. In the seventeen patients who recovered, drainage was observed to be much less than usual in such cases, and recovery was more rapid. The patient who died had had acute pain in the lower right quadrant for five days before coming to the hospital, and at operation an extensive peritonitis with a great deal of free pus was found.

Annals of Medical History, New York

6: 381-474 (Sept.) 1934

I. Dominic John Corrigan: His Place in the Development of Our Knowledge of Cardiac Disease: II. Water-Hammer Pulse. G. Dock, Pasadena, Calif.—p. 381.
L'Hotel-Dieu de Quebec. W. B. Howell, Montreal.—p. 396.
First Cholera Epidemic in Columbus, Ohio (1833). J. Forman, Columbus, Ohio.—p. 410.
History of Medical Education in New Orleans from Its Birth to the Civil War. A. E. Fossier, New Orleans.—p. 427.
European Anatomy Before Vesalius. W. T. Dempster, Ann Arbor, Mich.—p. 448.

Annals of Surgery, Philadelphia

100: 401-560 (Sept.) 1934

Sarcoma of Breast: Report of Sixty Cases. S. L. Fox, Baltimore.—p. 401.
Treatment of Acute Traumatic Hemothorax. J. M. Foster Jr. and D. Prey, Denver.—p. 422.
Cancer of Kidney: Squamous Cell Carcinoma of Renal Pelvis, with Especial Reference to Etiology. J. B. Gilbert and S. F. Macmillan, Schenectady, N. Y.—p. 429.
*Congenital Urinary Anomalies: Evaluation of Associated Obstructive Syndrome: Report of Six Cases. J. L. Wiseman, Winnipeg, Manit.—p. 445.
*Advantages of Preoperative X-Ray in Kidney Tumor in Children. A. Randall, Philadelphia.—p. 462.
Tumors of Lung, Secondary to Kidney Tumors. G. P. Muller, Philadelphia.—p. 476.
Carcinoma of Penis: Report of Thirty-Seven Cases. K. W. Horn and R. M. Nesbit, Ann Arbor, Mich.—p. 480.
Inflammatory Strictures of Rectum and Their Relation to Lymphogranuloma Inguinale. H. Lee and R. W. Staley, Cincinnati.—p. 486.
Carcinoma of Rectum: Question of Operability. A. A. Salvin, New York.—p. 496.
Procedures in Cleft Palate Surgery: Experiences with Veau and Dorrance Technic. R. H. Ivy and L. Curtis, Philadelphia.—p. 502.
Osteopetrosis. T. A. Shallow, W. B. Davis and J. T. Farrell Jr., Philadelphia.—p. 512.
Splenectomy in Mother and Daughter for Familial Hemolytic Jaundice. F. A. Loop, Cleveland.—p. 518.
Malignant Tumors of Greater Omentum. H. K. Ransom and P. C. Samson, Ann Arbor, Mich.—p. 523.
Congenital Syphilitic Osteomyelitis of Mandible: Report of Two Analogous Cases in Sisters. R. H. Ivy and L. Curtis, Philadelphia.—p. 535.
Anterior Dislocation of Shoulder Joint by Abduction and Internal Rotation. L. E. Snodgrass, Philadelphia.—p. 539.
Carotid-Jugular Anastomosis: Its Effect on Systemic Blood Pressure of Dog. N. Winslow and W. W. Walker, Baltimore.—p. 544.

Congenital Urinary Anomalies.—Wiseman states that before surgery for the obstructive effects of a congenital anomalous formation of the urinary tract is undertaken it is important to determine beforehand (1) the presence or absence and the degree of infection in the kidney on which it is proposed to carry out a plastic procedure, (2) the functional status of the involved organ and (3) the possibility of bilateral involvement. If the hydronephrotic kidney is a functionless mass and its mate can be demonstrated to have been spared a similar fate and to possess adequate functional capacity, nephrectomy should be performed. The existence of demonstrable bilateral hydronephrosis or pyelectasis of a solitary kidney are indications for conservative surgical procedures. The existence of a congenital urinary anomaly, by itself, is a potential source of obstruction and subsequent urinary stasis and infection. Anomalous blood vessels in close proximity to the upper third of the ureter, although not actually responsible for the collapse of the ureter, may by their pulsations interfere with the normal flow of the peristaltic wave down the ureter and thereby promote stasis and pyelectasis. Heminephrectomy of an infected hydronephrotic pelvis may be required when a solitary kidney is supplied with a double pelvis and corresponding ureteral reduplication, one of which becomes affected. This procedure may be employed for the resection of a unilateral fused kidney. Nephropexy, preferably by the Kelly method, may facilitate pelvic drainage and obviate further ureteral angulation, whenever the hydronephrotic kidney displays a tendency toward undue or excessive mobility. A ureterocele or ureterovesical cyst is usually associated with pronounced narrowing of the ureteral orifice which contributes to urinary stagnation and the development of pyelectasis of varying degree on the involved side. The accepted surgical procedure for their correction may be by the suprapubic approach with resection of the prolapsed cystic sac or transurethral electrodesiccation, the latter being preferred. Surgery in unilateral fused kidney is contraindicated unless complications such as calculus, pyonephrosis or hydronephrosis develop, in which case pyelotomy or heminephrectomy may be required. The measure of success or failure for the correction of hydronephrosis and the contributory ureteral obstruction may be gaged by the alleviation of symptoms, the pyelographic evidence of decreasing capacity of the sac and the return of its functional capacity estimated by differential function renal tests, and less accurately by the density of dye excreted following intravenous excretion urography.

Preoperative Roentgen Treatment in Renal Tumors.—Randall believes that the embryonic character of renal tumor in childhood permits one to expect a marked diminution in the size of the mass from adequate roentgen therapy. Such irradiation cannot be expected to be completely curative, i. e., to destroy completely all neoplastic cells. Recurrences after irradiation exhibit increased resistance to this form of therapy and ultimately the new growth exceeds irradiative destruction, i. e., becomes "fast" to any type of irradiation. The late arrival of these cases to the consultant surgeon, owing to their latent symptoms, renders their operative removal both hazardous and at times impossible. Preoperative irradiation not only decreases this operative hazard but by the decrease in size minimizes the additional danger of manipulative and traumatic spread of malignant cells. The choice of time for operation, after the completion of thorough irradiation, appears to be between the fourth and the sixth week. There has been no detrimental effect to prompt healing when operating at this interval after irradiation. The leukocyte count during the course of treatment should be watched as some patients develop a leukopenia, which is evidence of lowered resistance and, if marked, would contraindicate further irradiation at that time. The preoperative irradiation should include the chest and the abdomen, producing an unfertile field for metastatic transplants that may be dislodged by the handling of the tumor at extirpation. Three cases following this method are reported.

Canadian Medical Association Journal, Montreal

31: 237-346 (Sept.) 1934

Experimental Silicosis: Quartz, Sericite and Irritating Gases. W. D. Robson, Schumacher, Ont.; D. A. Irwin and E. J. King, Toronto.—p. 237.
Silica Dust. W. R. Franks, Toronto.—p. 245.
Cystinuria and Cystine Lithiasis. F. S. Patch, Montreal.—p. 250.
Xanthomatosis and Schüller-Christian Syndrome: Roentgenologic and Clinical Study. S. Reich, Vienna, Austria.—p. 256.
*Common Duct Obstruction with Lipiodol Studies of Cholangiectasis and Effects of Prolonged Drainage. P. H. T. Thorlakson and J. C. McMillan, Winnipeg, Manit.—p. 265.
Gonococcic Endocarditis. W. W. Eakin, Montreal.—p. 269.
*Benign Epithelial Invasion. W. Boyd, Winnipeg, Manit.—p. 273.
One Thousand Avertin Anesthesias. W. Bourne and P. E. O'Shaughnessy, Montreal.—p. 276.
Corrective Measures for Progressive Deafness. G. Berry, Worcester, Mass.—p. 284.
Fundamentals in Rectal Diagnosis. E. A. Daniels, London, England.—p. 289.
Treatment of Dietary Anemia. C. E. Snelling, Toronto.—p. 294.
Spinelli Operation Followed by Pregnancy and Labor. W. P. Tew, London, Ont.—p. 297.
Rôle of Pathologist in Diagnosis of Cancer. W. L. Robinson, Toronto.—p. 298.

Use of Iodized Oil in Common Duct Obstruction.—Thorlakson and McMillan used iodized poppy-seed oil in visualizing roentgenologically the biliary passages in five cases of obstruction of the common duct after drainage had been established. The roentgenograms illustrate the changes that occur in severe cases during the course of treatment, especially showing the marked improvement in the intrahepatic biliary system which results from prolonged drainage. In the authors' cases the poppy-seed oil passed into the duodenum without delay, but it also ran up into the duct system and outlined the intrahepatic biliary tree, in spite of the fact that there was obviously no distal obstruction. They feel that failure to visualize the intrahepatic system depends on a widespread cholangeitis and that this cholangeitis subsides following prolonged drainage or drainage and irrigation. The intrahepatic system will be visualized well as soon as the ducts are cleared of the viscid stagnant contents, and thus visualization indicates improvement following drainage and not necessarily obstruction, as Ginsburg and Benjamin point out. The authors' interpretation of the cases showing incomplete visualization of the biliary tract is that the finer radicles are filled with tenacious infected mucus which prevents the oil from spreading freely throughout the smaller bile passages. In such cases irrigation of the ducts with warm physiologic solution of sodium chloride is indicated and if this procedure is carried out with ordinary aseptic precautions it is not attended by any ill effects.

Benign Epithelial Invasion.—Boyd states that the columnar cells lining a tubular gland or covering a glandular surface may proliferate and form new glandular structures, not only on the surface but also in the depths of the tissue, to such an extent that the new formation may be separated widely from the original surface, although connected with it by a narrow tract. Should the latter be tortuous, the original connection with the surface can no longer be recognized in a single section and a mistaken diagnosis of carcinoma may be made. Such a condition may be called benign epithelial invasion. Stratified epithelium is also liable to this change, as may be seen at the edge of a chronic ulcer of the skin or in the lining of the ureter. The columnar epithelium lining the gallbladder, fallopian tubes, uterus and stomach offers excellent examples of the process, which the author discusses.

Journal of Immunology, Baltimore

27: 235-354 (Sept.) 1934

Duration of Immunity Produced in Rats by Feeding Pneumococcus Type I. V. Ross, New York.—p. 235.
Protective Antibodies Following Oral Administration of Pneumococcus Type I to Rats. V. Ross, New York.—p. 249.
Protective Antibodies Following Oral Administration of Pneumococcus Types II and III to Rats, with Some Data for Types IV, V and VI. V. Ross, New York.—p. 273.
*Oral Immunization of Humans Against Pneumococcus. V. Ross, New York.—p. 307.

Human Immunization Against Pneumococcus.—Ross states that following ingestion of pneumococcus vaccines about 75 per cent of the persons tested formed protective antibodies against type I and about 60 per cent against type II. The results for type III are approximately as for type II. Antibodies for type I have been found in most of the serums examined from seven to fourteen months after the oral administration of the vaccine. The indications are that the duration is the same for the three types. The protective substances appear promptly, being present within from two to three days following six feedings. The number of feedings employed has varied from two to ten. In one instance when two doses were given antibodies were formed. In some cases ten doses elicited no response. A new set of feedings was followed by the appearance of protective substances in the blood of about 50 per cent of such cases. It is estimated that a practical procedure would employ the pneumococci from 1,200 cc. of growth per type on each of six to ten successive days, the bacterial content being estimated at 10^9 per cubic centimeter. The use of completely autolyzed cultures, which contain several times as much antigenic material as the bacteria present in a growth of eighteen hours, would reduce proportionately the volume of broth to be handled. None of the several forms in which the vaccine has been prepared have proved superior to the others. The concentration of antibodies formed is generally such that 1 cc. of serum will protect a mouse against 5,000 fatal doses of pneumococci (types I and II). It is believed that these protective substances indicate a generalized resistance to the pneumococcus. Agglutinins have not been detected in serums in which protective antibodies have been found. Natural protective antibody against type I has been found in fairly large amounts in 10 per cent of the serums examined and in smaller amounts in 20 per cent more; in the case of type II the figures were 41 and 18 per cent; for type III, 31 and 50 per cent.

Journal of Industrial Hygiene, Baltimore

16: 255-326 (Sept.) 1934

Cancer of Urinary Bladder in Workers of Chemical Dye Factories and Dyeing Establishments: Review. W. C. Hueper, Philadelphia.—p. 255.
Cellular Response of Lymph Nodes to Various Dust Suspensions Introduced into Lymphatics. Katharina Stüber, Boston.—p. 282.
Cellular Response of Lymph Nodes to Suspensions of Crystalline Silica and Two Varieties of Sericite Introduced Through Lymphatics. C. K. Drinker, Madeleine E. Field and P. Drinker, Boston.—p. 296.
Clinical Study of Silicosis and Silicotuberculosis, Diagnosis Based on Roentgen Classification. W. C. Hall, Philadelphia.—p. 300.
Alcohol Studies: I. Experiments on Drivers of Motor Vehicles. P. Bahnsen and K. Vedel-Petersen, Copenhagen, Denmark.—p. 304.

Journal of Nutrition, Philadelphia

8: 253-376 (Sept. 10) 1934

Exogenous Melituria in Man. Beatrice G. Edwards and M. R. Everett, Oklahoma City.—p. 253.
Vitamin Studies: XIX. Assimilation of Carotene and Vitamin A in Presence of Mineral Oil. R. A. Dutcher, P. L. Harris, Eva R. Hartzler and N. B. Guerrant, State College, Pa.—p. 269.
*Appetite Stimulating and Growth Promoting Property of Liver. D. W. Johnson and L. S. Palmer, St. Paul.—p. 285.
Utilization of Energy Producing Nutriment and Protein as Affected by Individual Nutrient Deficiencies: II. Effects of Vitamin B Deficiency. F. J. McClure, L. Voris and E. B. Forbes, State College, Pa.—p. 295.
Fat-Soluble Vitamins and Dental Caries in Children. C. D. M. Day and H. J. Sedwick, Rochester, N. Y.—p. 309.
Use of Method of Partial Regression in Analysis of Comparative Feeding Trial Data: Part II. E. W. Crampton and J. W. Hopkins, Montreal.—p. 329.
Results of Ingestion of Cod Liver Oil and Yeast on Calcium and Phosphorus Metabolism of Women. Helen A. Hunscher, Eva Donelson, Betty Nims Erickson and Icie G. Macy, Detroit.—p. 341.
Determination of Vitamin A Values by Method of Single Feedings. H. C. Sherman and E. N. Todhunter, New York.—p. 347.
Vitamin B Deficient Ration. R. C. Bender, G. E. Flanigan and G. C. Supplee, Bainbridge, N. Y.—p. 357.
Vitamin B Supplementation of Milk. G. C. Supplee, R. C. Bender and G. E. Flanigan, Bainbridge, N. Y.—p. 365.

Effect of Liver on Appetite and Growth.—Johnson and Palmer studied the effect of several meat supplements on the growth and appetite of rats. In the first experiment fresh pork liver, when fed as a 0.5 Gm. daily supplement to a purified diet, increased growth and food consumption as compared to the controls receiving only the basal diet. When food consumption was controlled by use of the paired-feeding method, the rats receiving the liver supplement did not grow significantly faster than the controls. Liver meal, when fed in amounts equivalent to the fresh liver, increased the growth rates of the rats receiving it to a lesser degree than the fresh liver. Beef muscle meal when fed as a supplement to the basal diet did not increase food consumption. This result is

evidence that the palatability of a food itself is not a measure of its ability to stimulate the appetite for other foods with which it is not mixed. In the second experiment the appetizing properties of fresh pork liver, beef liver and calf liver and the effect on growth of fresh beef liver when food intake was controlled were studied. The three kinds of liver were found to increase food consumption and growth to a similar extent. The increased growth, however, is entirely the result of appetite stimulation, as shown by the equal growth of controls and those receiving the beef liver when food intake was equalized. Male rats showed a decidedly greater growth response to fresh liver supplements than did female rats. This was due in part to a greater consumption of food by the male rats and also to the fact that they utilized the greater food intake much more efficiently than the female rats. The experiments confirm the conclusion of Palmer and Kennedy and suggest a different interpretation of the growth resulting than from a so-called growth factor. The factor should be referred to solely as an appetite factor.

Journal of Urology, Baltimore

32: 231-320 (Sept.) 1934

Bilateral Pelvic Kidneys. W. M. Coppridge, Durham, N. C.—p. 231.
Crossed Renal Dystopia Without Fusion: Case Report. J. B. Sigal, Newington, Conn.—p. 236.
Nephrolithiasis in Case of Nephrobronchial Fistula: Case Report. R. F. Jones and A. R. Hughes, Washington, D. C.—p. 242.
Ectopic Ureter in Female. R. E. Alt, Boston.—p. 249.
Transplantation of Lower End of Dog's Ureter: Experimental Study: I. Reimplantation into Bladder. V. Vermooten, J. W. Spies and C. H. Neuswanger, New Haven, Conn.—p. 261.
Id.: II. Pathologic Changes in Ureter and Kidney Before End of Second Postoperative Month. V. Vermooten, New Haven, Conn.—p. 266.
Id.: III. Function of Ureterorectal Valve. V. Vermooten, New Haven, Conn.—p. 273.
Cystitis Emphysematosa: (1) In an Elderly Diabetic Woman; (2) in a Three-Months-Old Female Infant. S. Sanes and G. D. Doroshow, Buffalo.—p. 278.
Modification of McCarthy Visible Prostatic Punch for Transurethral Prostatic Resections. P. E. Wedgewood, San Diego, Calif.—p. 287.
Coexistent Cancer and Tuberculosis of Testicle: Case Report and Complete Review of Literature. J. P. Robertson, Birmingham, Ala., and J. B. Gilbert, Schenectady, N. Y.—p. 291.
Polyorchidism. H. E. Jordan, Charlottesville, Va., and A. I. Dodson, Richmond, Va.—p. 311.

New England Journal of Medicine, Boston

211: 479-520 (Sept. 13) 1934

Autopsy Findings in One Hundred Cases of Prostatic Cancer. E. R. Mintz and G. G. Smith, Boston.—p. 479.
Value of Icteric Indexes and Plasma Lipids in Diagnosis of Jaundice. E. R. Lehnherr, Boston.—p. 487.
Unusual Case of Traumatic Hernia. D. P. Penhallow, Washington, D. C.—p. 492.
Torsion of Spermatic Cord in Baby Ten Months Old: Report of Case. F. F. Henderson and P. S. Foisie, Boston.—p. 493.
Pulmonary Tuberculosis: Medical Aspect. R. M. Deming, Glencliff, N. H.—p. 500.

New Orleans Medical and Surgical Journal

87: 145-204 (Sept.) 1934

Some Practical Points Relating to Cancer of Female Breast: Review of Two Hundred and Eighty-Nine Cases. G. W. Wright, Monroe, La.—p. 145.
Cancer of Colon. J. A. Hendrick, Shreveport, La.—p. 150.
Importance of Biopsy in Diagnosis of Cancer. E. von Haam, New Orleans.—p. 153.
Skin Grafting: Its Indications, Limitations and Uses of Various Types of Grafts. N. Owens, New Orleans.—p. 158.
Principles Underlying Rational Treatment of Malaria. W. Krauss, Meridian, Miss.—p. 165.
Bronchoscopic Aspiration in Treatment of Lung Suppuration. H. L. Kearney, New Orleans.—p. 169.
Allergic Phenomena. G. W. F. Rembert, Jackson, Miss.—p. 173.

New York State Journal of Medicine, New York

34: 789-830 (Sept. 15) 1934

Pathologic Study of "Strawberry" Gallbladder. H. H. Cooke, Boston.—p. 789.
Treatment of Obesity. J. McCabe and J. F. Hart, New York.—p. 795.
When Should Senile Cataract Be Removed? A. J. Bedell, Albany.—p. 801.
What Progress Has Been Made in Perfecting Cataract Operation? B. W. Key, New York.—p. 803.
The Problem of the Premature Infant. R. M. Tyson, Philadelphia.—p. 811.
Diagnostic Value of Aspirin Test in Rheumatic Conditions. H. F. Wolf, New York.—p. 818.

Oklahoma State Medical Assn. Journal, McAlester

27: 307-348 (Sept.) 1934

Vaginal Hysterectomy. W. Long, Oklahoma City.—p. 307.
Septicemia. L. J. Starry, Oklahoma City.—p. 311.
Fascial Space and Bursal Infections of Hand. F. L. Flack, Tulsa.—p. 314.
Indications and Contraindications for Splenectomy. W. Langston, Oklahoma City.—p. 319.
Important Physical and Biologic Principles in Radiation Therapy. R. E. Myers, Oklahoma City.—p. 324.

Public Health Reports, Washington, D. C.

49: 1051-1074 (Sept. 7) 1934

Dermatitis in Nut and Bolt Plant Due to Use of Friction Tape. L. Schwartz and R. P. Albaugh.—p. 1051.
Child Health Activities in State Department of Health. Estella Ford Warner.—p. 1056.

49: 1075-1100 (Sept. 14) 1934

Effect of Various Amounts of Sodium Fluoride on Teeth of White Rats. H. T. Dean, W. H. Sebrell, R. P. Breaux and E. Elvove.—p. 1075.
Some Findings of the National Organization for Public Health Nursing Survey of Public Health Nursing of Significance to State Health Administrators. Pearl McIver.—p. 1081.

Surgery, Gynecology and Obstetrics, Chicago

59: 277-568 (Sept.) 1934

Acute Rapidly Spreading Infections Following Trivial Injuries of Hand. S. L. Koch, Chicago.—p. 277.
Dieffenbach-Warren Operation for Closure of Congenitally Cleft Palate. V. P. Blair and J. B. Brown, St. Louis.—p. 309.
*Hydatid Disease of Brain. H. R. Dew, Sydney, Australia.—p. 321.
Surgical Treatment of Exophthalmic Goiter: Late End Results. E. H. Pool and J. H. Garlock, New York.—p. 330.
Gastric Resection for Peptic Ulcer: Technic. H. M. Richter, Chicago.—p. 337.
Tumors of Tendon Sheaths. D. Lewis, Baltimore.—p. 344.
Present Status of Surgical Treatment of Peptic Ulcer. E. S. Judd and G. W. Waldron, Rochester, Minn.—p. 350.
Problems Involved in Treatment of Compound Fractures. F. A. Besley, Waukegan, Ill.—p. 354.
Adequate Bacteriologic Service for Surgical Department. F. L. Meleney, New York.—p. 358.
Tuberculous Tenosynovitis of Hand: Study of Thirty-Three Cases of Chronic Tenosynovitis of Hand. M. L. Mason, Chicago.—p. 363.
Type and Grade of Gastric Carcinoma in Relation to Operability and Prognosis. A. O. Whipple and T. S. Raiford, New York.—p. 397.
Cancer of Colon: Notes on Its Surgical Treatment. F. W. Rankin, Lexington, Ky.—p. 410.
Fractures of Neck of Femur, Dislocations of Hip and Obscure Vascular Disturbances Producing Aseptic Necrosis of Head of Femur. D. B. Phemister, Chicago.—p. 415.
Tumors of Tendon Sheaths: Their Close Biologic Relationship to Tumors of Joints and Bursae. J. J. Morton, Rochester, N. Y.—p. 441.
Indications for Surgical Treatment of Carcinoma of Stomach. D. C. Balfour, Rochester, Minn.—p. 453.
Fractures of Lateral Condyle of Tibia, Classification, Pathology and Treatment. W. R. Cubbins, A. H. Conley, J. J. Callahan and C. S. Scuderi, Chicago.—p. 461.
Argentaffine Tumors of Terminal Ileum: Cause of Intestinal Obstruction. W. E. Lee and J. S. Taylor, Philadelphia.—p. 469.
Subtotal Resection of Pancreas for Hypoglycemia. E. A. Graham and A. F. Hartmann, St. Louis.—p. 474.
Passive Vascular Exercise in Treatment of Peripheral Circulatory Disease. A. M. Shipley and G. H. Yeager, Baltimore.—p. 480.
*Surgical Limitations in Treatment of Acute Suppurative Peritonitis. J. R. Buchbinder, Chicago.—p. 485.
Treatment of Carcinoma at Rectosigmoid Junction by Obstruction Resection. V. C. David, Chicago.—p. 491.
I. Simultaneous Vein Ligation: Experimental Study of Effect of Ligation of Concomitant Vein on Incidence of Gangrene Following Arterial Obstruction. B. Brooks, G. S. Johnson and J. A. Kirtley Jr., Nashville, Tenn.—p. 496.
*Studies on Endobronchial Occlusion. E. C. Cutler and C. B. Wood, Boston.—p. 501.
Mechanism of Death in Massive Pulmonary Embolism: Comments on Trendelenburg Operation. E. D. Churchill, Boston.—p. 513.
Unattached Retroperitoneal Fibroma: Report of Case. J. A. Wolfer, Chicago.—p. 518.
Some Remarks on Operative Procedures for Appendicitis. M. R. Reid, Cincinnati.—p. 529.
Return of Sensation to Transplanted Skin. L. Davis, Chicago.—p. 533.

Hydatid Disease of the Brain.—Dew discusses hydatid disease of the brain and states that, as in the case of all organs, infestation of the brain with echinococcic disease may be either primary or secondary. In the former the cysts are derived from hexacant embryos which, after passage through the liver and lungs, have been carried by the carotid arterial stream to the brain. Secondary cysts are metastatic and result from the sowing by the blood stream of scolices, derived from a fertile primary simple cyst that has ruptured into the left side of the heart. It is obvious, although the fact has not been universally recognized, that the pathologic and clinical

aspects of the two types are different and, until this is appreciated, much confusion must occur in their interpretation. Primary cysts occur almost exclusively in young children, are simple, and give rise to clinical syndromes similar to any other benign, noninfiltrating tumor and are amenable to surgical operation. Secondary cysts occur almost exclusively in adults or adolescents, produce protean nervous manifestations owing to their multiplicity, and invariably produce fatal results, not being amenable to surgery.

Surgical Limitations in Treatment of Peritonitis.—Buchbinder states that the operative therapy of spreading peritonitis is limited to removal or closure of a septic focus, aspiration of the exudate and closure of the peritoneum without drainage, and that the abdominal wound above the serosa should be drained. The author's experimental and clinical observations are opposed to the opinion that operation during a spreading peritonitis increases the rate of spread and the area of contamination. Postoperative spreading peritonitis, particularly when the source is the intestinal tract, is nearly always a catastrophe, yet there is both justification and indication to invade the operative field early in the event of serious soiling. When a mounting temperature and particularly a rapidly mounting and persistently high pulse are present it is preferable to reopen the abdomen promptly, rather than to wait. It does not require a general peritonitis, or even a widespread lesion, to cause death. Therefore, prompt differentiation between serious soiling with infection and ileus without gross soiling must be made. All methods of direct surgical attack on suppurative spreading peritonitis, based on alteration of or interference with the functions of absorption and exudation, tend to increase the mortality. Drains function in localized peritoneal abscesses, but in spreading processes they not only encapsulate, regardless of the consistence of the exudate, but also provoke residual abscess and increase the diffusion of the infection.

Experimental Endobronchial Occlusion.—In searching for a substance to produce bronchial occlusion, Cutler and Wood recalled that painless strictures of the urethra were not uncommon following irrigations with acriflavine hydrochloride solution, which led them to believe that this drug in greater concentrations might have the desired action on the bronchus. Dogs weighing from 8 to 20 Kg. were used. They were anesthetized by the intraperitoneal injection of sodium pentobarbital. The bronchoscope was pushed down to the position where cicatrization was desired. Acriflavine was applied to the desired bronchus by moistening a cotton swab, wrapped tightly on the end of a long stiff wire, with the solution. The excess solution was expressed and the applicator was placed just within the bronchial orifice for from six to ten minutes, the duration of the application depending on the size of the bronchus. The swab should fit snugly into the orifice of the bronchus. When the swab was removed, if any excess secretion was present, this was wiped dry with a sponge. The treated area was usually a deep scarlet and its mucosa seemed withered. In the case of the lower right lobe, each of the numerous openings were treated in the same manner. If the entire right or left main primary bronchus was to be treated, a cotton wick 0.5 cm. by 5 to 8 cm., from which all excess of acriflavine had been pressed out with a sponge, was passed through the bronchoscope and packed tightly into the main primary bronchus and left in place for from fifteen to twenty minutes. Any excess solution was wiped dry when the wick was removed. By this method the primary bronchus can be occluded completely, two applications usually being necessary. The solution of acriflavine should be made up fresh every day. A fresh cotton applicator should be used for each bronchus. At first the authors used a 10 per cent solution but soon found that the caustic effect was inadequate. One bronchial occlusion (accessory lobe) resulted from a single application and one occlusion resulted from three applications to the accessory or subcardiac lobe. The rest of the experiments were made with 25 per cent acriflavine. In this group occlusion resulted with great regularity. No abscess formation occurred and, microscopically, damage to blood vessels was not observed. All the different bronchi have been completely stenosed. In several cases the entire lung has been made to collapse completely as the result of occlusion of all its bronchi.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Radiology, London

7: 449-512 (Aug.) 1934

Coarctation or Congenital Stenosis of the Aorta. Elizabeth Foley Taylor.—p. 452.
Radiography of Calcification in Cardiac Valves During Life. J. V. Sparks and C. Evans.—p. 463.
Demonstration of Fluorescent and Phosphorescent Effects of Zinc Sulphide. L. Levy and D. W. West.—p. 467.
Radioactivity of Radium Bromide Solutions for Internal Medication. W. E. Boyd.—p. 471.
Oscillographic Study of the Electrical Characteristics of X-Ray Generators. G. W. C. Kaye and G. E. Bell.—p. 476.

British Journal of Tuberculosis, London

28: 1-48 (Jan.) 1934

Charles Albert Calmette and Pierre Paul Émile Roux. C. Lillingston.—p. 1.
The Brontës: Study in Epidemiology of Tuberculosis. A. S. MacNalty.—p. 4.
*Tuberculosis and Allergic Diseases. G. W. Bray.—p. 7.
Artificial Light Treatment at Tuberculosis Dispensaries. G. L. Cox.—p. 13.
Cavity Treatment in Pulmonary Tuberculosis. Evelyn M. Holmes.—p. 17.
Tuberculosis in General Practice. E. Ward.—p. 21.

28: 49-104 (April) 1934

"G. P.'s and T. B.: Indictment": The Answer. H. B. Shaw.—p. 49.
Lipiodol Radiography in Tuberculosis Dispensary Practice. J. E. Wallace.—p. 63.
Housing and Tuberculosis. J. M. Mackintosh.—p. 67.
Review of Treatment of Peritoneal and Laryngeal Tuberculosis by Ultraviolet Radiations. A. Furniss.—p. 71.

Tuberculosis and Allergic Diseases.—Bray summarizes the association between tuberculosis and asthma as follows: 1. Only one asthmatic patient in a hundred gives any positive evidence of active tuberculosis. 2. Only one patient with active tuberculosis in two hundred suffers from true asthma. 3. When asthma does develop in a tuberculous subject, the sensitizing agent is generally of an inhalant nature and the asthma is relieved by its removal or by a course of specific desensitizing injections. In the rare cases in which the sensitizing agent is bacterial in nature, it is more often a secondary invader than the tubercle bacillus.

British Medical Journal, London

2: 339-380 (Aug. 25) 1934

Closed Anesthesia. W. B. Primrose.—p. 339.
X-Ray Treatment of Diseases of Genito-Urinary System. G. H. Orton.—p. 343.
*Diagnosis of Intracranial Tumor. H. G. Garland.—p. 346.
Headache Following Lumbar Puncture. H. W. Allen.—p. 349.
Defective Hearing as National Problem. G. P. Crowden.—p. 350.

Diagnosis of Intracranial Tumor.—Garland points out that any condition producing a rise of intracranial pressure or any localized lesion of the brain may in certain circumstances simulate cerebral tumor. One of the first conditions to consider is renal disease, in which there may be headache, vomiting and papilledema, sometimes associated with transient hemiplegia or monoplegia. The diagnosis depends on examination of the urine, the blood pressure (which is always raised in such a case) and the blood urea. Cerebral abscess does not often give rise to difficulty, as there is usually a history of recent disease of the ear. Papilledema is often absent in cases of cerebral abscess. Hydrocephalus following meningitis should not give rise to difficulty, but sometimes hydrocephalus complicates disease of the middle ear. This condition, which is called otitic hydrocephalus, is associated with high grade papilledema and is of doubtful origin. Cerebral aneurysm rarely simulates tumor, for the reason that aneurysms are usually small and give rise to symptoms only when they rupture. Neurosyphilis may simulate tumor in several ways: the early mental symptoms of a tumor sometimes resemble those of dementia paralytica of the insane, and in both epilepsy may occur. Gumma is a rare condition. Careful examination of the pupils, combined with serologic tests of the blood and cerebrospinal fluid, should prevent an error in diagnosis. Cerebral arteriosclerosis unassociated with renal changes produces an infinite variety of clinical signs which may resemble cerebral

tumor, and it is probably the frequency of vascular disease that makes the diagnosis of cerebral tumor much more difficult in middle-aged and older people.

Irish Journal of Medical Science, Dublin

No. **104:** 331-494 (Aug.) 1934

Ectopic Pregnancy at Term. J. F. Cunningham.—p. 480.

Journal of Physiology, London

82: 1-128 (Aug. 24) 1934

Pilocarpine and Gastric Anacidity in Monkeys. J. H. Ferguson, Joyce McGavran and Elizabeth R. B. Smith.—p. 1.
Studies on Physiology of Thyrotropic Hormone of Anterior Pituitary. Evelyn M. Anderson and J. B. Collip.—p. 11.
Magnetic Blood Oxygenator. E. W. H. Cruickshank.—p. 26.
Spectroscopic Comparison of Fetal and Maternal Blood of Rabbit and Goat. F. G. Hall.—p. 33.
Acetylcholine in Ox and Dog Blood. G. H. Ettinger and G. E. Hall.—p. 38.
Utilization of Blood Sugar and Formation of Lactic Acid by Lungs. C. L. Evans, F. Y. Hsu and T. Kosaka.—p. 41.
Effect of Water Drinking, Mineral Starvation and Salt Administration on Total Osmotic Pressure of Blood in Man, Chiefly in Relation to Problems of Water Absorption and Water Diuresis. E. J. Baldes and F. H. Smirk.—p. 62.
Fate of Carotene Introduced in Circulation. J. C. Drummond, H. P. Gilding and R. J. Macwalter.—p. 75.
Physiologic Study of Phosphagen in Plain Muscle. M. Grace Eggleton.—p. 79.
After Effects of Sudden Changes in Stimulation Rate Under Different Conditions of Anesthesia. Grace Briscoe.—p. 88.
Uterine Reactivity and Activity in the Mouse at Various Stages of Sex Cycle. J. M. Robson.—p. 105.
Changes in Clotting Time During and After Exercise in Dogs. J. Heřasymowycz.—p. 113.
Alleged Occurrence of Acetylcholine in Normal Ox Blood. J. V. Loach.—p. 118.
Chemical Transmission of Secretory Impulses to Sweat Glands of the Cat. H. H. Dale and W. Feldberg.—p. 121.

Journal of Tropical Medicine and Hygiene, London

37: 241-256 (Aug. 15) 1934

Intravenous Transmission of Malaria in Drug Addicts. J. A. Bradley.—p. 241.
Pellagra in the Sudan. N. L. Corkill.—p. 245.

Lancet, London

2: 467-522 (Sept. 1) 1934

Disturbances of Body Temperature. C. E. Lakin.—p. 467.
Test Meal in Diagnosis of Gastric Disease. N. F. Maclagan.—p. 471.
*Tetanus Treated with Curare. L. Cole.—p. 475.
Spinal Manipulation, with Especial Reference to Lumbosacral Strain and Brachial Neuritis. T. Marlin.—p. 477.
Regional Dissociations in Blood Pressure (Circulatory Anisergy). M. Villaret, L. Justin-Besançon and R. Cachera.—p. 479.
Treatment of Deafness. D. F. Fraser-Harris.—p. 481.

Tetanus Treated with Curare.—Among nineteen cases of tetanus, Cole presents two treated with curare. Eleven of these patients recovered. All of them, including the two who received curare, were treated on the same general lines, each being given a large dose of antitoxin by the intravenous route as early as possible and before the wound had been touched. The first case treated with curare was the most severe of those in which recovery occurred. Curare seemed to reduce the continuous rigidity of the limbs, abdomen and jaw, to lessen reflex excitability and to lessen the frequency and duration of the spasms in both cases. In the second case the severe spasms, induced by attempting to suck fluid and even by the sight of fluid, were stopped and swallowing was made possible. In the first case, in which the dose was relatively small, the action of the drug was apparent about two hours after the first injection. The effect appeared to last about forty-eight hours. In the second case the effect appeared five minutes after the injection. It is possible that in the first case the action was sufficient to tide the patient over the critical period of the illness by preventing exhaustion and by allowing more food to be given. No unpleasant symptoms were observed while the drug was being given and respiration did not appear to be affected in any way. No serious after-effects were noted, though it is possible that the rather prolonged weakness and wasting of the muscles of the arms and legs may have been due to the curare. The second case was of such rapid onset (incubation period forty-eight hours) and so severe that there was no chance of recovery. Treatment might have been more effective in prolonging life if it had been begun a few hours earlier. Given, however, when rigidity was continuous and when the reflex spasms were most severe and occurred every thirty seconds, curare checked the spasms, stopped the reflex excitability and lessened the rigidity. Respiratory failure occurred seven hours later when the heart had begun to fail. The results confirm the suggestion that curare or its alkaloids will be useful in the treatment of tetanus. Dosage, however, is at present a difficult problem and will remain so until standardized preparations are available and more is known of the particular actions of its various alkaloids.

Practitioner, London

133: 225-344 (Sept.) 1934

Headaches and Facial Neuralgia. W. Harris.—p. 225.
Earache and Its Treatment. J. F. O'Malley.—p. 234.
Dental Pain. G. Jack.—p. 251.
Treatment of Cardiac Pain. A. W. Stott.—p. 263.
Treatment of Pain in Lumbago and Sciatica. F. G. Thomson.—p. 274.
Abdominal Pain: Its Significance and Treatment. Z. Cope.—p. 281.
Causation and Treatment of Pelvic Pain in Women. N. White.—p. 294.
Foot Pain. J. Fraser.—p. 304.
Phobia. E. Snowden.—p. 315.
Medicolegal Problems in General Practice: IX. Criminal Abortion. F. J. McCann.—p. 321.

South African Medical Journal, Cape Town

8: 509-548 (July 28) 1934

Mineral Deficiency Diseases of Livestock in South Africa. J. H. R. Bisschop.—p. 511.
Mineral Metabolism in Relation to Production in Livestock. A. I. Malan.—p. 514.
Minerals in Diet and Teeth. F. W. Fox.—p. 517.
Cardiac Abnormalities of Abdominal Origin. J. Drummond.—p. 520.
Surgical Importance of Ketosis and Cyclic Vomiting. G. F. Fismer.—p. 524.

8: 549-588 (Aug. 11) 1934

Tick-Bite Fever: Clinical Lecture. A. Pijper.—p. 551.
Workmen's Compensation Act. C. E. Nixon.—p. 557.
Outbreak of Acute Anterior Poliomyelitis. C. D. Brink.—p. 560.
Reminiscences of Old Fossil. H. Caiger.—p. 564.
Somnifaine Treatment in Psychiatry. F. H. Kooy.—p. 567.
Vesicovaginal and Kindred Fistulas. A. B. Taylor.—p. 570.

Tubercle, London

15: 481-528 (Aug.) 1934

Problem of Bronchial Spirochetosis. E. Zimmerli.—p. 481.
Study of the Occurrence of Virulent Tubercle Bacilli in the Excreta of Tuberculous Indian Children. A. B. Simes and L. E. Paynter.—p. 498.

Chinese Medical Journal, Peiping

48: 607-700 (July) 1934

Lymphogranuloma Inguinale Among Chinese. J. Gray and J. Y. C. Yieh.—p. 607.
Lymphogranuloma Inguinale: Fourth Venereal Disease: Report of Five Cases. L. K. Wang and J. K. Shen.—p. 615.
*Calcium and Phosphorus Metabolism in Osteomalacia: I. Effect of Vitamin D and Its Apparent Duration. R. R. Hannon, S. H. Liu, H. I. Chu, S. H. Wang, K. C. Chen and S. K. Chou.—p. 623.
Incidence of Osteomyelitis of Jaw Bones Among the Chinese. A. F. Baranoff.—p. 637.
Menstrual Cycle in Chinese of East Central China. S. H. Yang and H. S. Gear.—p. 642.
Pregnancy Polyneuritis: Food Deficiency Disorder? T. S. Sze.—p. 651.
Some Public Health Measures Applied to Kala Azar. R. B. McClure.—p. 659.
Scientific Medicine in Kwangtung. F. Oldt.—p. 663.
Two Large Ovarian Cysts. F. W. Goddard.—p. 672.

Calcium and Phosphorus Metabolism in Osteomalacia.—Hannon and his associates present data on calcium, phosphorus and nitrogen metabolism for thirty-four periods of four days each from a case of relatively early osteomalacia in which no vitamin D therapy had been given prior to the studies. The essential metabolic abnormality in the patient is a lack of absorption of calcium through the intestinal tract, there being no increase in endogenous calcium excretion. The absence of calcium in the urine in the presence of an approximately normal serum calcium level is taken as evidence of conservation of endogenous calcium elimination. Vitamin D administered in relatively small dosage and for a limited period increased remarkably the absorption of calcium and decreased endogenous calcium elimination, thus resulting in a striking calcium and phosphorus retention and deposition in the bone. The beneficial action of vitamin D was sustained for at least four months after its administration was discontinued.

Archives de Médecine des Enfants, Paris

37: 513-576 (Sept.) 1934

Lung Abscess in the Child: Roentgenologic Study. G. Paisseau, R. Jame and E. Friedmann.—p. 513.
Blood Cholesterol in Diabetes of Children. P. Nobécourt and P. Ducas. —p. 522.
*Treatment of Cerebrospinal Meningitis: Systematic Use by Suboccipital Route. Facatselli and Facatselli Jr.—p. 527.
Contribution to Study of Initial Period of Infantile Kala-Azar. R. Guerschénowitsch.—p. 531.
Biologic Treatment of Injuries of Brain in Course of Infectious Diseases. K. Rachid.—p. 535.

Treatment of Cerebrospinal Meningitis.—The Facatsellis believe that the greatest obstacle to the reduction of mortality from epidemic meningitis lies in the fact that areas of involved meninges become separated by adhesions, thus preventing the free circulation of the serum. The probable solution of this mechanical difficulty consists in the use of multiple routes for bringing the serum in contact with all the diseased parts. The suboccipital route always and the intraventricular, when possible, in addition to the lumbar offer the best hope of fulfilling this purpose. This procedure was applied to fifteen patients, with good results in eleven. Of the remaining four, only two recovered, but the delay in starting treatment in these four was from three to four days. Technically, the suboccipital injection is easy and requires only a little practice. The systematic use of the suboccipital route is possible at all ages. For nurslings the intraventricular route is added to the other two.

Presse Médicale, Paris

42: 1369-1384 (Sept. 1) 1934

Melioidosis: Septicemic Form of Slow Evolution. F. Toullec and P. Huard.—p. 1369.
*Therapeutic Action of Certain Renal Extracts in Treatment of Arterial Hypertension. D.-M. Gomez.—p. 1371.

Treatment of Hypertension with Renal Extracts.—Forty patients presenting different forms of arterial hypertension were treated by Gomez with an extract from the cortical region of the kidney. Before treatment was begun the patients were observed almost every day for a control period of about two weeks. The treatment consisted in the hypodermic injection of 5 cc. of the extract daily for from six to eight days. The effect on the minimal and maximal arterial tension, on the blood urea and on the symptomatology were noted. In patients with some signs of renal insufficiency, such as uremia, nocturnal pollakiuria or uremic lesions in the ocular fundi, improvement was the rule. Most of the subjective symptoms disappeared or improved and there was a parallel and lasting decrease in the arterial tension and blood urea. This was true in sixteen of the seventeen more or less uremic patients treated. In the eleven cases of sclerotic hypertension, the results were not quite so good. The results were still less favorable in the four cases of menopausal hypertension treated, although three of four were favorably influenced. In so-called essential hypertension, good results were obtained in only two of eight patients. The author states that advanced cardiac insufficiency is no contraindication for this method of treatment.

Giornale di Clinica Medica, Parma

15: 1083-1208 (Sept. 20) 1934

Clinical Value of New Method of Exploration of Hepatic Function. F. Vannucci and G. Ferrari.—p. 1083.
*Indirect Pain Localizations in Gastric and Duodenal Ulcer: Diagnostic Value and Pathogenesis of Costal Points of Pain. G. Ferretti.—p. 1093.
Splenotesticular Correlations. S. Princigalli.—p. 1115.
Addisonian Syndrome and Amyloidosis of Suprarenals. S. De Renzi. —p. 1133.
Action of Prehypophyseal Extract on Development and Differentiation of Skin and of Hair. A. Gennari.—p. 1143.
Undulant Fever Cured with Single Injection of Vaccine: Case. M. Sella and G. Drei.—p. 1147.
Cancer of Stomach and Practical Importance of Its Repercussion on Cardiovascular Apparatus. F. Nolli.—p. 1151.

Indirect Pain Localizations in Gastric Ulcer.—Ferretti refers to a number of patients presenting gastric and duodenal ulcers with points of pain on costal pressure. He explains these painful points in the following manner: The disease state of the wall of the stomach functions as a primary stimulus, which, conducted by the sympathetic fibers to the cerebrospinal system, arrives at the cortex, where it produces a painful sensation erroneously projected to the corresponding dermatome. This he calls sympathetic intercostal neuralgia. If the stimulus is not sufficiently powerful, and therefore below the threshold, an added stimulus is necessary. In order for this painful stimulus to be perceived in the cortex, a secondary stimulus must be produced. The author believes that this occurs by the pressure of the involved dermatomes and is carried to the cerebral centers by way of the cerebrospinal system. This will also sometimes be referred to the cutaneous terminations (point of pain production). The author concludes that these points of pain are of great value in the diagnosis of gastric and duodenal ulcers.

Archiv für Kinderheilkunde, Stuttgart

103: 1-128 (Sept. 4) 1934. Partial Index

Old and New Methods in Treatment of Toxicosis. H. Wilke.—p. 1.
*Cerebral Disturbances During Childhood and Their Encephalographic Diagnosis. K. Rupilius.—p. 32.
*Pathology and Therapy of Cardiac Disturbances of Nurslings with Dysentery. P. von Kiss.—p. 50.
Cutaneous Exanthem in Aphthous Stomatitis. R. Mayer.—p. 78.
Rare Tracheostenoses During Childhood. P. Widowitz.—p. 80.
Agenesia of Left Lung. F. Hepner.—p. 92.
Menstruatio Praecox in Child, Aged 1, with Advanced Development of Secondary Sex Characters. H. Stiasny.—p. 97.

Encephalography in Cerebral Disturbances During Childhood.—Rupilius discusses the anatomic structure of the cerebrospinal fluid spaces. Exact knowledge of these spaces is an absolute requirement for the interpretation of the roentgenograms. For encephalography the child should be fasting, and sedatives or hypnotics should be given. Of the three possible modes of introduction of air—ventricular, cisternal or lumbar—the author prefers the latter. He never resorts to the cisternal puncture, because it makes movements of the head impossible, which are often necessary for the filling process; moreover, it is difficult in restless children. He resorted to ventricular puncture only in those instances in which air filling of the ventricles from below proved impossible. There were no undesirable complications; on the contrary, this measure often had a therapeutic effect by reducing the pressure. This method is especially simple in nurslings and small children with open fontanel. Lumbar puncture was always done in the sitting position. Kyphotic curvature of the back and a slight forward bending of the head were found advantageous. Immediately following the puncture, the head may be bent back and forth several times. The author used a fine needle and introduced less air than the amount of fluid withdrawn. The quantity of air varied between 10 and 100 cc., but in most instances it was less than 50 cc. The author performed roentgenoscopy immediately following the introduction of air, contrary to the practice of other diagnosticians, who wait several hours. The resorption of the air was controlled by repeated roentgenoscopies. There was no relation between the quantity of air injected and the rapidity of resorption. The author emphasizes that the mere taking of a roentgenogram is insufficient but that roentgenoscopy should be done first in different directions, because if only a portion of the cerebrospinal fluid has been removed roentgenoscopy alone will give a clear picture of the ventricles. Roentgenoscopy and roentgenography must complement each other and each alone is of little value. In encephalographies of nurslings there frequently was an air accumulation on the surface of the brain, while the filling of the ventricles met with difficulties. Encephalography has a much wider application in children than in adults, for, while in adults it is employed mostly for the diagnosis of tumors, in children it is resorted to generally in chronic inflammations of the brain or its meninges. In acute processes some investigators have seen exacerbations result after encephalography, but the author never made such an observation. In epidemic encephalitis the evacuation of the cerebrospinal fluid by air inflation has been known to produce therapeutic effects. Moreover, encephalography reveals the further changes in the brain, such as the development of hydrocephalus. In congenital or obstetric cerebral defects, encephalography often gives clear pictures of the changes. In convulsions of an epileptic or an obscure nature, encephalography may permit a differentiation between genuine and residual epilepsy. The author assumes a genuine epilepsy only if the picture reveals no gross defects.

Pathologic pictures may indicate former inflammatory or traumatic changes. In cases of hemiplegia, contralateral changes were frequently detected. This made possible an exact localization and was thus an important factor in the successful operative removal of the focus. Interesting and typical pictures were obtained also in cases of cerebral paralysis, idiocy and imbecility.

Cardiac Disturbances of Nurslings with Dysentery.—Von Kiss points out that, from the standpoint of cardiac disturbances, dysentery of nurslings can be divided into two stages. During the early stage of dysentery, the cardiac changes are primarily functional. There is a severe tachycardia and a pathologic dilatation of the coronary vessels. Anatomic changes, if present at all during this time, are limited to certain elements in the sino-auricular node and to the muscles immediately surrounding it. In the later course of the disease, the heart shows symptoms of wear. The cardiac changes are produced by the pathogenic organisms of dysentery or by the toxins of these organisms. Other factors are the secondarily developed acidosis, azotemia, exsiccosis, changes in the osmotic condition, damage to the vasomotor system, the peculiar function of the kidney of nurslings, and in addition to this probably the B. coli infection and the resorption of the pathologic products of disintegration. During the early stage it is important that the nursling be kept absolutely quiet. The nursling should be treated like a patient with heart disease in the severest stage of decompensation. Transfusion of large amounts of blood or injection of great quantities of dextrose solution of high concentration, as well as epinephrine and medicaments with a similar action, are contraindicated during the early stage. Instead the author recommends a large dose of digitalis and the intravenous administration of from 10 to 12 cc. of physiologic solution of sodium chloride with 5 or 8 per cent of dextrose for each kilogram of body weight. If necessary, this measure may be repeated within twenty-four hours. In the later stages of the disease it is advisable to give digitalis in small doses and small quantities of a 20 per cent solution of dextrose alternately with small blood transfusions.

Beiträge zur Klinik der Tuberkulose, Berlin

85: 73-138 (July 23) 1934

*Sympathetic Nervous System and Menstruation in Pulmonary Tuberculosis. N. Smilovits.—p. 73.
"Third" Optic in Thoracoscopy. K. Eisenstaedt.—p. 101.
Treatment of Pleurisy with Sanocrysin. Edith Høst and K. Secher.—p. 107.
*Connection Between Sedimentation Speed of Erythrocytes and Calcium Content of Serum in Tuberculous Persons. G. Kurakane.—p. 113.
Clinical Aspects and Pathology of Isolated Round Foci of Lungs. W. Klein and K. Wolff.—p. 116.

Sympathetic Nervous System and Menstruation in Pulmonary Tuberculosis.—Smilovits shows that in tuberculosis the sympathetic nervous system undergoes alterations which result in changes in single and in synergistic organ functions. They become manifest in alterations of the metabolism and in allergic processes and thus influence the course of the tuberculosis. The extragenital functional waves of the female organism are only distant actions of the ovarian activity and develop through the mediation of the sympathetic correlation. Within the state of equilibrium there exists a sympathetic instability, to which the author ascribes the premenstrual hyperthermia of the healthy woman. The menstrual disturbances that occur in tuberculosis, such as changes in the duration, the intensity and the interval, and amenorrhea or dysmenorrhea, are caused by processes of degeneration in the ovarian parenchyma, which are the result of the action of tuberculous toxins. The premenstrual hyperthermia indicates an active process in the woman with pulmonary tuberculosis only if the decrease of the hyperthermia is retarded. The menstrual and postmenstrual hyperthermias, however, indicate a toxic condition. The more prolonged the menstrual and postmenstrual hyperthermias and the shorter the nonfebrile interval, the greater is the progressiveness of the pulmonary process. The menstrual manifestations indicate only the condition existing at the time. The pulmonary process is not necessarily unfavorably influenced by the menstruation. The manifestations are the result of a sympathetic hyperirritability, which sensitizes the temperature center for toxins eliminated in increased quantities during menstruation. The temporary decrease in immunity that occurs during menstruation is insignificant. The author thinks that at the change of the seasons, particularly in the spring, the concurrence of an increased sympathetic irritability and of an increased allergic state may eventually result in a menstrual reactivation of the tuberculous process. He shows that the general conservative measures and some of the local treatments (collapse therapy) exert their influence by way of the sympathetic nervous system. Substitutional organotherapy has failed in tuberculosis; however, all menstrual disturbances in tuberculosis can be influenced favorably by medicaments that have a central and a peripheral action, by a belladonna preparation, ergotamine and phenylethylbarbituric acid.

Calcium Content of Serum in Tuberculous Persons.—In studies on the serum of patients with tuberculosis, Kurakane observed that the calcium content of the blood influences the sedimentation speed of the erythrocytes. The lower the calcium content the greater is the sedimentation speed. The author shows, however, that this rule applies only to female patients.

Deutsche medizinische Wochenschrift, Leipzig

60: 1227-1262 (Aug. 17) 1934

Prophylactic Inoculation Against Diphtheria and Evaluation of Vaccines. W. Kolle and R. Prigge.—p. 1227.
*Infection with Bacillus Botulinus. R. Hürthle and H. Gross.—p. 1232.
*Forms of Arthritis Caused by Paratyphoid Bacilli. J. Ruiz Gijon.—p. 1234.
What Therapeutic Possibilities are Furnished by Electrocardiogram? A. Hinrichs.—p. 1235.
Requirements for Resorption of Bismuth from Gastro-Intestinal Canal. S. Serefis.—p. 1237.
Early Diagnosis of Malignant Tumors of Kidney. Nonnenbruch.—p. 1240.
Calcium and Phosphoric Acid in Physiology of Nutrition. O. Loew.—p. 1242.
Crossed Dystopy of Kidney and Intravenous Pyelography. Hachez.—p. 1243.

Infection with Bacillus Botulinus.—Hürthle and Gross report the histories of two patients who, after eating blood sausage and canned beans, suddenly developed bulbar symptoms: impairments of the muscles of the eye with disturbances of movement and accommodation, of the facial nerve (cessation of salivation), of the glossopharyngeal nerve (disturbances in swallowing) and of the vagus nerve (gastro-intestinal symptoms). In one of the patients a paralysis of the left phrenic nerve existed for some time, and in the other one gastro-enteritis accompanied the botulism. The author considers the two cases noteworthy because they demonstrate the favorable influence of large doses of serum; one patient received twice 100 cc. of serum and the other 150 and 100 cc.

Arthritis Caused by Paratyphoid Bacilli.—Ruiz Gijon relates the history of a youth, aged 18, who had a severe inflammation of the right hip joint. The roentgenologic aspects indicated an osteomyelitic process. The incision of the joint yielded a thick, yellow-gray, creamy pus, the bacteriologic culture of which showed paratyphoid B in pure culture. The agglutination in the blood was positive in a dilution of 1:800 and the blood culture was likewise positive. The urine and feces were free from bacilli. The first intervention on the joint led to no improvement, and a second one was done. The second operation revealed extensive necroses of the cartilages but no impairment of the bone. The necroses were removed. The joint was left open and was irrigated daily. Under this treatment, improvement was comparatively rapid. The author states that paratyphoid infections of the joints have been known almost as long as the paratyphoid bacilli. The majority of cases thus far reported, however, either accompanied or immediately followed a paratyphoid infection. Moreover, in the majority of cases it was paratyphoid N that caused the articular disturbance. In this case the previous history showed no record of paratyphoid. Repeated tests on stools and feces yielded no paratyphoid bacilli, and tests on the excreta of mother and sister likewise remained negative. At the age of 1 year the patient had had a coxitis, and the author assumes that the impairment of the joint at that time may be a factor in the development of the present process, as a previous trauma plays a part in the articular localization of paratyphoid infection.

60: 1263-1298 (Aug. 24) 1934. Partial Index

Chronic Poisoning with Carbon Monoxide. K. Süpfle.—p. 1263.
*Atony of Small Intestine, a Symptom Valuable in the Diagnosis of Disorders of Hepatobiliary System. L. Bayer.—p. 1270.
Radon-Ointment Therapy. P. Happel.—p. 1274.
Erroneous Diagnoses in Headaches. G. Voss.—p. 1278.

Atony of Small Intestine in Disorders of Hepatobiliary System.—In the course of roentgenologic studies on the small intestine, Bayer noted that in cholecystopathies the roentgenograms of the small intestine show certain characteristics in the time of passage as well as in the shape of the intestinal loops. The passage is retarded and the intestinal loops are dilated, which indicates that the hepatobiliary diseases influence the peristalsis and the tonus of the small intestine. In an attempt to explain this behavior of the small intestine during hepatobiliary disorders, he points out that the bile has an inhibiting influence on the smooth muscles and that, if bile enters the blood, the tonus and the peristalsis are reduced.

Deutsche Zeitschrift für Nervenheilkunde, Berlin

134: 121-216 (July 24) 1934

Chronic Articular Diseases During Age of Growth in Their Dependence on Central Nervous System. V. Schaefer.—p. 121.
Syringomyelia or Occupational Disease in Workers with Compressed Air (Dysraphia as Predisposing Factor). E. Guttmann.—p. 148.
Syphilitic Spinal Paralysis. N. A. Popow.—p. 155.
*Early Infantile Progressive Spinal Muscular Atrophy (Werdnig-Hoffmann) and Its Relation to Congenital Myatonia (Oppenheim). O. Schildknecht.—p. 163.
Diabetes Insipidus After Epidemic Encephalitis with Histologic Changes. B. Hechst.—p. 182.
*Clinical Aspects of Postencephalitic Visual Spasm. G. Engerth.—p. 191.
Traumatic Development of Syringomyelia on Basis of Primary Hematomyelia. F. Krause and R. Glatt.—p. 199.

Early Infantile Progressive Spinal Muscular Atrophy.—Schildknecht shows that early infantile progressive spinal muscular atrophy is characterized by a continuous progress of the disorder, which seems to be the only symptom that permits a sure differentiation from myatonia. Familial occurrence and the time of development of the first symptoms may be characteristic in some cases but are not of decisive significance. The pathologic-anatomic examination reveals degeneration of the pyramidal cells in the anterior central convolution with predominance of a process leading to atrophy, severe degeneration of the motor cells of the anterior horn of the spinal cord with considerable reduction in their number, degenerative processes in the peripheral nerves, degenerative changes in the terminal motor plates and atrophy of the paralyzed muscles. A comparison with myatonia (on the basis of the studies of Bielschowsky) leads the author to the conclusion that early infantile progressive spinal muscular atrophy (Werdnig-Hoffmann's disease) is essentially a progressive degeneration of nerve cells, which leads to retrogressive processes in the muscles and the terminal motor plates and which differs essentially from myatonia. The definite pathologic-anatomic diagnosis necessitates still other investigations, particularly the examination of the terminal motor organs. This point gives the best prospects for a better insight into the nature of early infantile progressive spinal muscular atrophy.

Postencephalitic Visual Spasms.—Engerth describes a case of postencephalitic visual spasm with peculiar symptoms. Immediately before and during the attacks of visual spasm, states of anxiety and thoughts of compulsion exist. The patient, aged 17, becomes obsessed with the idea that he will have to leave home in order to recover, but at the same time he fears that he cannot move during the spasm. At the severest stage of the visual spasm, he has thoughts of suicide. A somnolent state terminates the visual spasm. After awakening, the patient is in a euphoric state, but at this time he occasionally carries out this compulsion idea. He runs away from home and cannot be held back by anything. His memory for happenings and acts during this time is deficient. The author attempts to show the relations between compulsion ideas, destructive bent, somnolence as the neutralization of the destructive inclination, and the carrying out of the compulsion idea. The case illustrates that the visual spasm, the subsequent sleep and the compulsory action after awakening must be considered as a coherent disease process. Because of the criminal action committed in the course of a compulsory flight, the case is of importance for forensic medicine.

Medizinische Klinik, Berlin

30: 1081-1112 (Aug. 17) 1934. Partial Index

Castration from Standpoint of Psychiatrist. J. Lange.—p. 1081.
Hygienic Problems in Labor and Sport Camps. B. Kemkes.—p. 1084.
Sexual Hormone Therapy in Gynecology. J. Novak.—p. 1089.
Bakers' Asthma and Allergic Disease. W. Anton.—p. 1092.
*Autocerebrospinal Fluid Treatment Combined with Passive Immunotherapy in Acute Stage of Anterior Poliomyelitis. G. Török.—p. 1093.
Urinary Infection and Demonstration of Nitrites in Urine. K. Machold.—p. 1097.

Autocerebrospinal Fluid Treatment in Poliomyelitis.—Török describes the method he employed in the treatment of forty-nine cases. Immunization was done by means of intramuscular injection of equal parts of blood from convalescents and from adults. Small children were given from 30 to 40 cc., older ones from 40 to 50. At the same time from 15 to 20 cc. of the spinal punctate was injected intramuscularly. Cerebrospinal fluid was withdrawn every second day. The usual amount was from 30 to 40 cc. Half of this quantity was injected on the day of withdrawal and the other half on the following day. In patients in whom the treatment was begun during the preparalytic stage, the injections were continued until the fibrinogen reaction became negative, which as a rule was after about eight injections. The patients with acute paralytic symptoms were given twelve injections. In some cases the injection of the blood from convalescents and adults was repeated after several days. The author points out that in acute anterior poliomyelitis it is difficult to estimate the results of a therapeutic method, but the statistical comparison of his material with that of others shows that the combination therapy produced more favorable results. Among the factors that led to a trial with the autocerebrospinal fluid therapy was the observation that in pleuritic processes, for instance, the parenteral administration of several cubic centimeters of the exudate may exert a favorable effect on the resorption of the exudate.

Wiener klinische Wochenschrift, Vienna

47: 1009-1032 (Aug. 17) 1934. Partial Index

*Action Mechanism of Venesection. K. Hitzenberger.—p. 1009.
*Simple Method for Determination of Velocity of Blood Circulation in Human Veins. H. Homma.—p. 1011.
Local Anesthesia with Nupercaine. G. Kraucher.—p. 1018.
*Therapeutic Results of Combined Arsenic-Gold Therapy in Lupus Erythematodes. K. Steiner.—p. 1019.
*Simultaneous Application of Diathermy and Histamine in Subacute and Chronic Polyarthritides. A. Dzsinich.—p. 1021.
General Metabolism of Substances Containing Nitrogen in Tuberculosis. I. Balanescu, D. Zamfir, S. Oeriu and I. Stancescu.—p. 1023.
Significance of Various Vaginal Hemorrhages. L. Kraul.—p. 1024.

Effects of Venesection.—Hitzenberger shows that in patients with arterial hypoxemia venesection improves the oxygen saturation of the arterial blood. The oxyhemoglobin content of the arterial blood becomes absolutely or relatively improved in these patients. The pathologically increased carbon dioxide content of the arterial blood is reduced by venesection. In patients with pneumonia, who have an abnormally low carbon dioxide content of the arterial blood, venesection brings the values near to normal. However, venesection produces no appreciable changes in patients in whom the oxygen and carbon dioxide contents are normal. The author gained the impression that the described results of venesection persist for about fourteen days. He thinks that venesection is indicated in hypoxemia of pulmonary origin and that approximately 500 cc. must be withdrawn to effect an improvement in hypoxemia.

Determination of Velocity of Blood.—Homma describes a method that permits the measurement of the velocity of blood in the vein of the arm. The method consists in the intravenous administration of a small drop of iodized poppy-seed oil or of iodized sesame oil before the roentgen screen, and in determining with a stop watch the time that is required for this drop to travel between two points that have been marked on the arm by means of two strips of sheet lead. The strips are usually placed about 10 cm. apart, the distal one about 3 cm. proximal from the bend of the elbow. The syringe as well as the oil is brought to approximate body temperature. The injecting needle is placed into the vein either without stasis or after a short stasis. After the examiner has made sure that the needle is in the vein, the light is turned off and the position before the screen is taken so that the needle as well

as the two lead marks on the arm are visible on the screen. Then the injection is made with the right hand while the left one holds a stop watch. If the oil has the correct temperature (between 30 and 40 C.), one or several little drops are formed and are carried along by the blood stream; the stop watch determines how much time is required to cover the distance between the two marks. The injection should not be made immediately after the stasis, because a change in the velocity is caused by the stasis; but it is also inadvisable to leave the needle in the vein too long. The author thinks that it will generally be possible to inject before the lapse of thirty seconds. In describing his experiences with this method, he points out that double determinations reveal either a greater velocity in the basilic vein than in the cephalic vein or the same velocity in the two vessels; rarely is the blood stream slower in the basilic vein. The velocity of the blood stream varies considerably in different persons. The author differentiates three types. He considers the circulation slow in the persons in whom the velocity is less than 1.5 cm. a second, average when it is between 1.5 and 4 cm., and fast when it is more than 4 cm. He shows that the method involves no danger, is simple and exact, and has clinical value.

Combined Arsenic-Gold Therapy in Lupus Erythematodes.—The method recommended by Steiner consists in the prolonged oral administration of arsenic in the form of solution of potassium arsenite mixed in equal parts with tincture of ferrated extract of apples and in a series of injections of an oily emulsion of gold. At first three drops of the mixed solution are given three times daily. This dose is increased daily or every second day by one drop until signs of arsenic irritation commence to appear (local inflammation and dissemination of small, new erythemas, eventually also cutaneous itching, dryness of the pharynx and burning of the eyes). The maximal dose should be from fifteen to twenty drops three times daily. As soon as signs of irritation appear the dose of the arsenic medication is rapidly decreased, but the arsenic medication should never be stopped suddenly, even if severe signs of irritation are present, for this would intensify the symptoms. At the time when the arsenic dose is rather high, at any rate when the patient is under a sufficient arsenic action, the intragluteal injection of the gold emulsion is begun. At first a 2 per cent oil suspension of aurothiodextrose is given in gradually increasing doses, and later increasing doses of a 20 per cent emulsion are administered. The highest single dose of the 20 per cent suspension of aurothiodextrose is 0.06 Gm., and it is reached after from twelve to fifteen injections. The highest doses (0.04, 0.05, 0.06 Gm.) are repeated from three to four times. The intervals between injections are from five to seven days. The total amount of gold suspension administered during the entire treatment is approximately 0.5 Gm. The result of this procedure was that fourteen of nineteen patients with lupus erythematodes were cured in from two to three months. Nearly all of these patients had previously been unsuccessfully treated with other remedies. The cases with considerable dissemination seem to be especially suitable for this treatment. A complete explanation of the mode of action of the combined arsenic-gold therapy cannot be given as yet. However, the author assumes that arsenic changes the capillary walls to such an extent that the penetration of the gold salt into the tissues is promoted and the gold action thereby increased.

Diathermy and Histamine in Polyarthritis.—In cases in which, after a previous acute polyarthritis, relapses developed so that the disorder was in the subacute or the chronic stage, Dzsinich resorted to the injection of histamine and to diathermy. The subcutaneous injections were begun with 0.5 mg. of histamine, and, when there was no noticeable reaction, the dose was increased to 1 mg. The injections were usually made near the involved joints. In the beginning of the histamine reaction, diathermy was applied to the diseased joint for twenty minutes. These treatments had to be given from ten to twenty times and in a few cases more often. Of thirteen patients treated in this manner, five were cured, five greatly improved, two slightly improved and one remained uninfluenced. The author thinks that further trials with the method are justified. He ascribes the efficacy of the treatment to three factors: (1) the desensitizing action of histamine, (2) the general physical action, and (3) the deep hyperemia produced by the diathermy in addition to the more superficial vasodilatory action of histamine.

Zentralblatt für Chirurgie, Leipzig

61: 1969-2016 (Aug. 25) 1934

*Anaphylactic Shock and Serum Disease and Their Treatment. A. Buzello.—p. 1970.
Serum Treatment in Peritonitis. J. Vorschütz.—p. 1976.
Value of Thorough Blood Study in Surgery: Contribution to Symptomatology of Agranulocytosis. E. Melchior.—p. 1979.
Treatment of Fractures of Humerus Below the Head: New Extension Apparatus. H. Schupp.—p. 1981.
Cystoid Pneumatosis of the Intestine in Man. B. Nimet.—p. 1986.
Concealed Mesenteric Phlegmon with Prevertebral Abscess: Resection, Cure; Case. W. Voigt.—p. 1988.
Question of Traumatic Appendicitis. K. Bartels.—p. 1991.
New Electrical Dry Shaving Apparatus. S. König.—p. 1994.

Treatment of Anaphylactic Shock and Serum Disease.—Buzello states that foreign proteins when injected into the human body circulate in the blood for some time in the original state. These substances are rendered harmless by the formation of antibodies, which become bound down to certain cells and are demonstrable in the blood. This process is referred to as hypersensitivity or anaphylaxis. During this period the introduced proteins referred to now as antigens become converted from freely soluble albumins and globulins into more or less insoluble ones. Anaphylaxis develops from seven to ten days after the injection of the serum. Once established, it persists for a long time, even a lifetime. Serum shock and serum sickness are due to the reaction between the bound down antibodies and the still undissolved protein substances. The human body can react to serum injection in one of two ways: with an immediate reaction or anaphylactic shock, or with a late reaction or serum sickness. Anaphylactic shock may take place in a previously injected person, as well as after the first injection. Its occurrence is favored by a congenital or hereditary susceptibility or allergy. On the whole, its occurrence is rare. It develops most frequently following an intravenous injection in a person previously treated with the same serum. It is manifested by pallor, chills, vomiting, cold sweat, small fast pulse, fall in the blood pressure and ensuing circulatory failure. This may lead to collapse, widely dilated pupils, dyspnea and convulsions. The author suggests immediate cessation of further injection and exhibition of a cardiac stimulant (2 cc. of pentamethylene tetrazol). Next, 1 cc. of 1:1,000 epinephrine is administered, either alone or in physiologic solution of sodium chloride. Starck recently showed that symptoms of anaphylactic shock are improved by induction of a mild degree of ether narcosis. The slower the serum is injected, the less likelihood there is of a shock. The author therefore insists that serums should preferably be injected hypodermically, possibly intramuscularly, but never intravenously. One should inquire beforehand into the possible sensitivity of the patient as revealed by a history of hay fever or asthma. A positive history suggests that the patient is allergic and that other than horse serum should be used in his case. Serum disease is much more frequent than anaphylactic shock. It may likewise occur after a repeated injection or after the first injection. Its symptoms develop from the fourth to the seventh day in a previously injected person, and from the seventh to the ninth day after the first injection. At the seat of injection there develop redness, edema and burning pain. There are headache, fatigue, fever, generalized urticaria, chills, sweats, and bone and joint pains. Diarrhea and circulatory failure may develop. Symptoms persist for four or five days and disappear without leaving ill effects. In children under the age of 10 years, cardiac failure and edema of the glottis may give concern. Treatment consists in support of the circulation and exhibition of some calcium salt. It occurred to the author that, since the serum disease represents the reaction between the antibodies and the still undissolved antigens, a repetition of the injection at the right moment could abolish or at least diminish that reaction by furnishing the body new antigens, so that a surplus of antigens is present. He was surprised at the good results following this treatment both in patients with severe symptoms of serum disease and in patients with beginning manifestations of it. A number of patients thus treated were followed up for some time and there was not another case of serum disease observed.

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*Radium Treatment in Benign Genital Hemorrhage. H. Naujoks and H. Hoffmann.—p. 1922.
Baumm's Metreurynter Employing Animal Bladder. G. Peter.—p. 1935.
*Tonsils and Mammary Glands During Puberty. S. Peller and Ilse Zimmermann.—p. 1950.
Nonpregnant Uterus Presenting an Obstacle to Delivery in Case of Double Uterus. Margarethe Oing.—p. 1954.
Solitary Cutaneous Metastasis in Carcinoma of Uterine Cervix. F. Friedl.—p. 1956.
*Site of Formation of Gonadotropic Substance of Pregnancy Urine. T. Remzi.—p. 1962.
New Automatic Ligature Instrument for Abdominal Amputation of Uterus. H. Hillebrand.—p. 1966.

Radium Treatment in Benign Genital Hemorrhages.—Naujoks and Hoffmann relate their experiences with radium therapy in benign genital disorders. Metrorrhagias and abnormally profuse menstrual hemorrhages in women more than 40 years of age were the most frequent indication for radium treatment. Rarer indications were diseases of blood, such as leukemia and essential thrombopenia, also tuberculosis of the endometrium, juvenile menorrhagias and sterilization. The authors made their observations on 285 women, 252 of these having premenopausal or menopausal hemorrhages. In describing the technic, they point out that they always precede the introduction of the radium tube by an abrasion. Following this, a radium preparation, 50 mg. in weight, enclosed in a brass filter of 1 mm. wall thickness, 6 mm. in length and covered by a thin rubber membrane, is introduced. The lower portion of the cervical canal and the vaginal vault are filled with gauze, so as to prevent the tube from sliding down into the vagina. In order to facilitate the discharge from the uterus during the one or two days the radium preparation is retained, a strip of gauze is placed alongside the radium container and led outward past the external uterine os. The tamponade of the vagina and particularly of the posterior vaginal vault not only aims at fixing the container but also exerts an upward and forward pressing of the uterus so as to remove it as far as possible from the ovaries. The authors emphasize the necessity of complete asepsis in the application of the radium. In discussing the dosage, they point out that some radiologists have recommended small doses, while others advised rather large ones. They themselves are in favor of the larger doses, from 2,000 to 2,400 mg. element hours. After-examinations of 213 cases revealed that radium treatment had failed in only two of these cases and both of these women had myoma. In the so-called menopausal hemorrhages, radium treatment was almost 100 per cent effective. The authors think that the symptoms of abolished function that may develop after radium treatment are not sufficiently severe to be considered a contraindication to it. They conclude that intra-uterine radium therapy deserves a prominent place in the treatment of benign gynecologic disorders.

Tonsils and Mammary Glands During Puberty.—Peller and Zimmermann continued Peller's studies, in which were demonstrated the inhibiting influence of the tonsils on the growth in height and in weight, on the development of the thorax and on the menarche, and the promoting influence of the tonsils on the photochemical defense reaction of the skin. In this paper they report their observations on the relations between tonsils and the mammary glands. They gained the impression that the tonsils inhibit the puberal development of the mammary glands, for girls who had undergone tonsillectomy showed an earlier development. It is assumed that the tonsils influence the maturation of the mammary glands not directly but indirectly by way of the general development.

Site of Formation of Gonadotropic Substances.—Remzi relates the histories of two women. One died shortly after operation for cystic mole and the other one after an operation for chorionepithelioma. The urines of both patients contained large amounts of gonadotropic hormones and the implantation of parts of the operative specimens gave positive reactions I, II and III in the Aschheim-Zondek test. Implantation of parts of the anterior lobe of the hypophysis that had been removed in both patients during necropsy, however, gave negative Aschheim-Zondek reactions, which proves that the hypophysis contained no gonadotropic substances. The author points out that other investigators of the gonadotropic substances found in the urine during pregnancy, cystic mole and chorionepithelioma have suggested other, extrahypophyseal, origins, such as placental or chorionic sources. The fact that the hormone production is especially profuse in cystic mole and in chorionepithelioma, that is, in conditions with chorionic proliferation, seems to speak for a chorionic origin. However, nothing definite can be said about the site of origin of the gonadotropic substances. The author mentions several experiments that according to Aschheim's suggestion should be carried out in order to determine the hypophyseal origin of these substances.

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76: 687-768 (Aug.) 1934

Chronic Ulcer of Penis Following Lymphogranuloma. A. Cedercreutz.—p. 687.
Experimental Investigations on Tension in Retinal Veins of Rabbit in Increased Brain Pressure. J. G. Lindberg.—p. 694.
*Cases of Ovarian Carcinoma Treated at Gynecologic Clinic in Helsingfors from 1919 to 1933. C. von Numers.—p. 720.

Ovarian Carcinoma.—Von Numers says that of the 151 cases of ovarian carcinoma in which treatment was given at the gynecologic clinic in Helsingfors from 1919 to 1933 only seventeen, or 11.3 per cent, were surely secondary. The average age of the patients was 49.1 years; marked increase in the frequency of ovarian carcinoma appeared between 35 and 40, and the greatest number of cases occurred between 45 and 50. Of the entire number of cases 46.6 per cent, and of the secondary carcinomas 88.2 per cent, were bilateral. There was no definite deviation from the normal in the average age of the menarche and the frequency of sterility, but the average fertility was somewhat lower than usual in Finland. There was no evidence of greater disposition to ovarian carcinoma among unmarried women. Ascites was present in 39.1 per cent of all cases. Eighty-two, or 55.8 per cent, were in an operable condition. The primary operative mortality was 7.3 per cent. Observation for at least five years showed an absolute percentage of recovery of 17.8 and a relative percentage of 38.1, exclusive of the secondary cases. No notable effect of postoperative roentgen treatment could be determined.

Norsk Magasin for Lægevidenskapen, Oslo

95: 1001-1112 (Sept.) 1934

Factors in Prognosis. S. Laache.—p. 1001.
*Cancer of Stomach in Surgical Division of Rikshospital from 1913 to 1928. P. Bull.—p. 1035.
Sedimentation Rate of Red Blood Corpuscles During Pregnancy, Parturition and Puerperium. H. Rasmussen.—p. 1048.
*Rheumatic Arteritis and Rheumatic Nodes. F. Harbitz.—p. 1078.
Blood Transfusion: Method for Determination of Blood Types. J. Rø.—p. 1085.
Intermittent Ileus Caused by Fecalith. R. Steinert.—p. 1090.

Cancer of Stomach.—Bull's material comprises 289 cases, 206 in men and 83 in women, the fate of all but five being known. Radical operation was performed in 23.3 per cent of the men and 30 per cent of the women. In 20.2 per cent of the cases in which operation could not be performed, clinical symptoms had been present for only one to five months. The author states that the patients with cancer of the stomach who undergo resection have an average life duration from five to six times longer than the patients in the other groups and he urges that in operation every effort be made to perform resection. The results of the operation depend fully as much on the degree of malignity of the cancer in each case as on its clinical duration. Tabulated review is given of the eleven patients still living from three and three fourths to thirteen and a half years after resection and of the five cases in which death occurred from recurrence after from three and a third to nine years after resection.

Rheumatic Arteritis and Rheumatic Nodes.—Harbitz asserts that there is a rheumatic arteritis analogous to rheumatic inflammation of the heart musculature and in and around the joints; it is characteristic to a certain degree and extensive enough to be of great importance. He is inclined to believe that there is also a "visceral febrile rheumatism" which does not affect the joints, localized to the heart and blood vessels and possibly other internal organs (including the kidneys), and that this visceral rheumatism is the basis for certain grave and even fatal disorders.